

DRAFT REPORT

ECONOMIC ANALYSIS OF CRITICAL HABITAT DESIGNATION FOR THE RIVERSIDE FAIRY SHRIMP

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EXECUTIVE SUMMARY AND REPORT ORGANIZATION

- 1 The purpose of this report is to identify and analyze the potential economic impacts associated with the designation of critical habitat for the Riverside fairy shrimp (*Streptocephalus woottoni* or RFS). This report was prepared by Economic & Planning Systems, Inc., under contract to Industrial Economics, Inc. for the U.S. Fish and Wildlife Service (Service).
- 2 The RFS is a crustacean species that inhabits vernal pools in Southern California. Vernal pools, which form each year during the rains of winter and spring and generally dry up during the early summer, are home to a variety of animal and plant species. As a result of the seasonal changes in the habitat, the RFS have adapted to both wet and dry conditions, remaining dormant in cyst form until sufficient rains allow for growth and reproduction. In 1993 the RFS was federally listed by the Service as endangered, and in 2000 approximately 12,000 acres were proposed for designation as critical habitat. The final rule reduced the designation to 6,900 acres.
- 3 In October 2002, the United States District Court of the District of Columbia vacated the existing designation and ordered the Service to publish a new final rule. The current proposed designation encompasses 5,795 acres in five units of proposed critical habitat, part of 18,330 acres of essential habitat. Of the 18,330-acre total, 12,535 acres are excluded from the designation. The proposed habitat units are distributed from Ventura County in the north, to Riverside County in the east, through Los Angeles and Orange Counties in the middle, and to San Diego County in the South. The majority of excluded habitat is located in Riverside and San Diego Counties. The majority of lands proposed are found in Orange and San Diego Counties.
- 4 Section 4(b)(2) of the Endangered Species Act (Act) requires the Service to designate critical habitat on the basis of the best scientific data available, after taking into consideration the economic impact, and any other relevant impact, of specifying any particular area as critical habitat. The Service may exclude areas from critical habitat designation when the benefits of exclusion outweigh the benefits of including the areas in critical habitat, provided the exclusion will not result in extinction of the species.
- 5 This Draft Economic Analysis (DEA) considers the potential economic effects of designating critical habitat for the RFS. It also considers the economic effects of protective measures taken as a result of the listing of the RFS as an endangered species, and other Federal, State, and local laws that aid habitat conservation in essential habitat areas. Actions undertaken to meet the requirements of other Federal, state, and local laws may afford protection to the RFS and its habitat, and thus contribute to the efficacy of critical habitat-related conservation and recovery

efforts.¹ Thus, the impacts of these actions are relevant for understanding the full impact of the proposed designation.

- 6 This analysis considers both economic efficiency and distributional effects. In the case of habitat conservation, efficiency effects generally reflect the “opportunity costs” associated with the commitment of resources to comply with habitat protection measures (e.g., lost economic opportunities associated with restrictions on land use). This analysis also addresses how potential economic impacts are likely to be distributed, including an assessment of any local or regional impacts of habitat conservation and the potential effects of conservation activities on small entities and the energy industry. This information can be used by decision-makers to assess whether the effects of the designation might unduly burden a particular group or economic sector. Finally, this analysis looks retrospectively at costs that have been incurred since the date the species was listed and considers those costs that may occur after the designation is finalized.

FRAMEWORK FOR THE ANALYSIS

- 7 The Service has identified more than 18,000 acres of essential habitat for the RFS in almost 30 different subregions of five different counties. Each of the habitat subregions, ranging in size from 30 to 4,400 acres, has a name that appears in common cartographic usage, and those names are used throughout this analysis. To assist in describing the nature of projects and impacts for all 18,000 acres, this analysis evaluates this land area by grouping either the essential habitat subregions or the economic impacts on projects located in essential habitat in one of four basic ways:
- Acres or impacts are segregated by county
 - Impacts are segregated by time period, either past or future.²
 - Acres or impacts are segregated by essential habitat component, either *proposed for designation* or *excluded from designation*.
 - Acres or impacts are segregated by economic activity, such as real estate development (a private activity) or airport expansion (a public activity).
- 8 Throughout the DEA, this analysis first quantifies the impact of RFS-related conservation actions undertaken before the designation of critical habitat, from the time of the listing up until

¹ These requirements include activities undertaken pursuant to sections 4, 7, 9, and 10 of the Act.

² Past impacts are consistently referenced as *impacts since listing* and refer to impacts occurring between 1993 and the present time. Future impacts are referenced as *impacts 2005-2024* and include impacts expected over the next 20 years.

now. These are referred to as past impacts. These past impacts include administrative and project modification costs borne by Federal agencies as well as the efficiency and distributional effects of land use regulation of private activities. The analysis then considers future administrative and project modification costs and the range of impacts that could result from future RFS-related conservation actions. The most detail is provided for the largest estimated impacts, regardless of the economic activity or location producing the impact. Effects that, when summed across habitat subregions and time periods, are smaller than \$20,000 generally are not included.³

- 9 To conduct the analysis, best available data are gathered from a variety of sources, including regional, city, and county planning agencies; land developers and conservancies; and project managers, including those for both preserves and planned developments.
- 10 The largest share of economic impacts identified by this analysis is to real estate development. Given the magnitude of forecast real estate development impacts in each category of impact, the analysis performs a screening test for efficiency and distributional effects that go beyond the impact on the project applicant or landowner only. That is, where changes in the regional output of housing, for instance, may be associated with RFS-related conservation activities, consumer and producer impacts for the entire housing market may exist.
- 11 The screening test concludes that the amount of housing potentially removed from the market supply in each county is not a significant amount of the total supply of new housing. Under these conditions, significant consumer or producer surplus losses are not expected. However, for past impacts occurring on lands excluded from designation, the housing market in both San Diego County may have experienced reduced output or increased prices as a result of RFS-related conservation activities.

TOTAL IMPACTS FROM RFS CONSERVATION

- 12 In total, RFS-related conservation activities will impose a \$470 million to \$770 million cost on private and public entities in RFS essential habitat. These totals include \$400 million in impacts estimated to have occurred since the listing of the species in 1993 and \$70 million to \$370 million in impacts that may occur in the 20 years following the proposed designation of critical habitat. A range of costs was estimated for future impacts on private landowners in areas proposed for designation. The range of costs allows for potentially wide variation in the size and location of vernal pools on property where real estate development may be impacted by RFS conservation. These variables in turn exert a strong influence on the magnitude of real estate development impacts for a particular site.

³ Impacts of this size are unlikely to change the magnitude of the estimated total impact.

IMPACTS SINCE THE LISTING OF THE RFS

- 13 Between 1993 and the present time, RFS-related conservation activities were associated with an annual impact of \$3.6 million for 5,795 acres of proposed lands (\$43 million, total, for this period) and \$30 million for 12,535 acres of excluded lands (\$358 million, total; see **Tables ES-1** and **ES-2**). Landowners with developable land in essential habitat bear the majority of impacts experienced since the listing of the RFS in 1993, as less than 5 percent of the impact total occurring in public activities such as military base decommissioning and road construction. As shown in **Figure ES-1**, because of the location of land proposed versus excluded from the designation, impacts for excluded lands are larger than impacts for proposed lands by a ratio of more than 8 to 1. For comparison purposes, **Table ES-3** reports the habitat subregions with the largest total cost impacts since the listing of the RFS.

LAND PROPOSED FOR DESIGNATION

- 14 The Otay Mesa subregion of San Diego County accounts for more than 85 percent of the \$43 million of impacts associated with RFS-related conservation activities. These impacts occur in the southeastern portion of the East Otay Mesa Specific Plan and along the Mexican Border in the City of San Diego. Conservation of private lands in areas not yet part of the regional Habitat Conservation Plan (HCP) known as the MSCP generates a significant portion of this impact on real estate development. The other major impact, accounting for 10 percent of the total, occurs in the Carlsberg Ranch area of Los Angeles County, where RFS-related land use restrictions imposed large costs on a residential project outside of the City of Santa Clarita.
- 15 It is not possible, using available data, to determine exactly how much of preserved land in the areas proposed for designation were preserved for the immediate needs of the RFS rather than for other ecological or cultural objectives, and the exact date of the habitat purchase or land dedication is also unknown. This analysis, using recent year Geographic Information System (GIS) land use data describing current land uses, seeks to provide a reasonable upper bound for the costs of RFS protection since 1993.

LAND EXCLUDED FROM THE DESIGNATION

- 16 Four habitat subregions account for 99 percent of the \$358 million in total impacts associated with RFS-related conservation activities in land excluded from the designation:
- Otay Mesa (San Diego County)
 - Skunk Hollow/Johnson Ranch (Riverside County)
 - Schleuniger Pool/Clayton Ranch (Riverside County)
 - Santa Rosa Plateau (Riverside County)

Table ES-1
U.S. Fish & Wildlife Service
Draft Economic Analysis for Critical Habitat Designation for the RFS
Summary of Impacts to Lands Proposed for Designation

Economic Activity/ Habitat Subregion	LANDS PROPOSED FOR DESIGNATION [1] [2]				
	Cost Impacts Since Listing [3]	Cost Impacts 2005-2024 [4]			
		Total		Per Acre	
		Low	High	Low	High
	2004\$	2004\$	2004\$	2004\$	2004\$
REAL ESTATE DEVELOPMENT					
Ventura County					
Carlsberg Ranch/Tierra Rajada	\$4,000,000	\$376,000	\$376,000	\$700	\$700
Los Angeles County					
Cruzan Mesa	-	\$6,601,000	\$37,215,000	\$12,400	\$69,700
LAX	-	-	-	-	-
Orange County					
Fomer MCAS El Toro	-	-	-	-	-
Saddleback Meadows	\$1,105,000	\$10,572,000	\$59,688,000	\$14,000	\$78,900
Viejo Conservation Bank	-	-	-	-	-
Tijeras Creek	-	\$5,405,000	\$30,572,000	-	\$92,600
Chiquita Ridge	-	\$7,961,000	\$44,819,000	\$15,800	\$89,200
Radio Tower Road	-	-	-	-	-
Riverside County					
Lake Elsinore	-	-	-	-	-
Santa Rosa Plateau	-	-	-	-	-
Schleuniger Pool/Clayton Ranch	-	-	-	-	-
Scott Road	-	-	-	-	-
Banning	-	-	-	-	-
Former March AFB	-	-	-	-	-
Skunk Hollow/Johnson Ranch	-	-	-	-	-
San Diego County					
Otay Mesa	\$36,513,000	\$5,360,000	\$31,388,000	\$4,800	\$28,000
Subtotal, Real Estate Development	\$41,618,000	\$36,275,000	\$204,058,000		
MILITARY TRAINING					
Pendleton, San Diego County	-	-	-	-	-
MILITARY BASE DECOMMISSIONING					
Former March AFB, Riverside County	\$745,000	-	-	-	-
Fomer MCAS El Toro, Orange County	\$670,000	\$102,000	\$102,000	\$700	\$700
Subtotal, Military Base Decommissioning	\$1,415,000	\$102,000	\$102,000		
AIRPORT EXPANSION					
LAX, Los Angeles County	-	\$538,000	\$538,000	\$5,200	\$5,200
PUBLIC PARK IMPROVEMENTS					
O'Neill Park, Orange County	-	\$28,000	\$28,000	\$40	\$40
RAIL CONSTRUCTION					
Poinsettia Lane Train Station, San Diego County	\$104,000	\$28,000	\$28,000	\$200	\$200
ROAD CONSTRUCTION					
SR125, San Diego County	-	-	-	-	-
SR905, San Diego County	-	-	-	-	-
SR35, San Diego County	-	-	-	-	-
Subtotal, Road Construction	-	-	-		
INDIRECT COSTS					
CEQA	-	\$1,903,000	\$1,903,000		
TOTAL, ALL ECONOMIC ACTIVITIES	\$43,137,000	\$38,874,000	\$206,657,000		
Annualized Impact [5]	\$3,595,000	\$3,669,000	\$19,507,000		

"prop total"

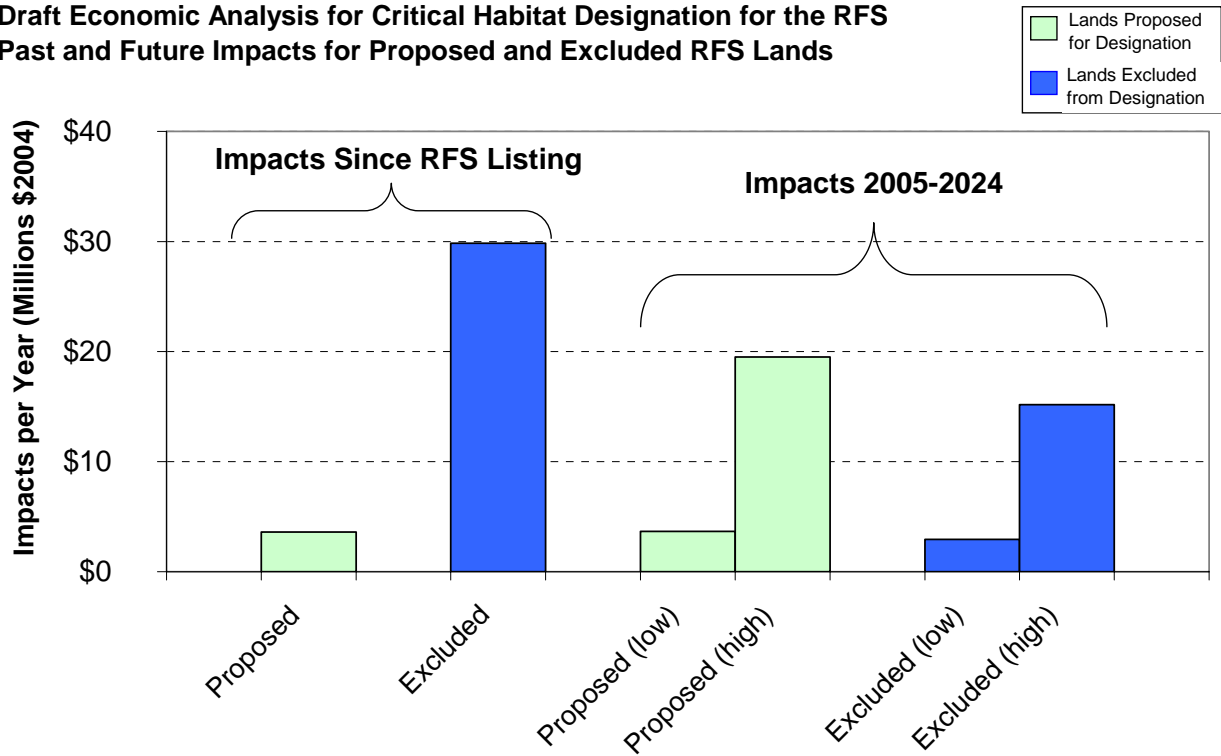
[1] Dashes indicate a value of zero.
[2] Affected areas may differ from those in the proposed rule. Data used in the DEA are current as of January 26, 2003.
[3] Expressed in current year constant dollars. Past year real estate impacts are escalated based on foregone gains in land value that are assumed to be invested at a 7% annual rate. Past year public activities (all other activity categories) are escalated at a 7% social discount rate.
[4] Expressed in current year constant dollars. All impacts are discounted at a 7% social discount rate. Cost of regulatory delay is included.
[5] Expressed as an annuity payment at a 7% social discount rate.

Table ES-2
U.S. Fish & Wildlife Service
Draft Economic Analysis for Critical Habitat Designation for the RFS
Summary of Impacts to Lands Excluded from Designation

Economic Activity / Habitat Subregion	LANDS EXCLUDED FROM DESIGNATION [1] [2]				
	Cost Impacts Since Listing [3]	Cost Impacts 2005-2024 [4]			
		Total		Per Acre	
		Low	High	Low	High
	2004\$	2004\$	2004\$	2004\$	2004\$
REAL ESTATE DEVELOPMENT					
Ventura County					
Carlsberg Ranch/Tierra Rajada	-	-	-	-	-
Los Angeles County					
Cruzan Mesa	-	-	-	-	-
LAX	-	-	-	-	-
Orange County					
Fomer MCAS El Toro	-	-	-	-	-
Saddleback Meadows	-	-	-	-	-
Viejo Conservation Bank	\$544,000	-	-	-	-
Tijeras Creek	-	-	-	-	-
Chiquita Ridge	-	-	-	-	-
Radio Tower Road	-	-	-	-	-
Riverside County					
Lake Elsinore	-	\$4,330,000	\$25,979,000	\$7,700	\$46,300
Santa Rosa Plateau	\$16,000,000	\$10,685,000	\$64,111,000	\$2,400	\$14,600
Schleuniger Pool/Clayton Ranch	\$39,927,000	-	-	-	-
Scott Road	-	\$196,000	\$1,177,000	\$6,600	\$39,700
Banning	-	\$1,329,000	\$7,974,000	\$6,000	\$35,900
Former March AFB	-	-	-	-	-
Skunk Hollow/Johnson Ranch	\$71,725,000	-	-	-	-
San Diego County					
Otay Mesa	\$229,706,000	\$10,518,000	\$57,711,000	\$3,000	\$16,400
Subtotal, Real Estate Development	\$357,902,000	\$27,058,000	\$156,952,000		
MILITARY TRAINING					
Pendleton, San Diego County	-	-	-	-	-
MILITARY BASE DECOMMISSIONING					
Former March AFB, Riverside County	-	-	-	-	-
Fomer MCAS El Toro, Orange County	\$75,000	\$11,000	\$11,000	\$700	\$700
Subtotal, Military Base Decommissioning	\$75,000	\$11,000	\$11,000		
AIRPORT EXPANSION					
LAX, Los Angeles County	-	-	-	-	-
PUBLIC PARK IMPROVEMENTS					
O'Neill Park, Orange County	-	-	-	-	-
RAIL CONSTRUCTION					
Poinsettia Lane Train Station, San Diego County	-	-	-	-	-
ROAD CONSTRUCTION					
SR125, San Diego County	\$239,000	-	-	-	-
SR905, San Diego County	-	\$28,000	\$28,000	\$10	\$10
SR35, San Diego County	-	\$567,000	\$567,000	\$200	\$200
Subtotal, Road Construction	\$239,000	\$595,000	\$595,000		
INDIRECT COSTS					
CEQA		\$3,290,000	\$3,290,000		
TOTAL, ALL ECONOMIC ACTIVITIES	\$358,216,000	\$30,954,000	\$160,848,000		
Annualized Impact [5]	\$29,851,000	\$2,922,000	\$15,183,000		

[1] Dashes indicate a value of zero.
[2] Affected areas may differ from those in the proposed rule. Data used in the DEA are current as of January 26, 2003.
[3] Expressed in current year constant dollars. Past year real estate impacts are escalated based on foregone gains in land value that are assumed to be invested at a 7% annual rate. Past year public activities (all other activity categories) are escalated at a 7% social discount rate.
[4] Expressed in current year constant dollars. All impacts are discounted at a 7% social discount rate. Cost of regulatory delay is included.
[5] Expressed as an annuity payment at a 7% social discount rate.

Figure ES-1
U.S. Fish & Wildlife Service
Draft Economic Analysis for Critical Habitat Designation for the RFS
Past and Future Impacts for Proposed and Excluded RFS Lands



- 17 In San Diego County, large amounts of private land have been protected from development as part of the regional HCP known as the MSCP. Over half of the total impact is generated from this subregion. Second to the Otay Mesa subregion impact, the development activity in the City of Temecula and nearby unincorporated Riverside County areas created the Skunk Hollow and Johnson Ranch Preserves. This subregion generates 20 percent of the total impacts since RFS listing.
- 18 Habitat preserved in the Schleuniger Pool/Clayton Ranch subregion northeast of the City of Murrieta in unincorporated Riverside County is responsible for 11 percent of the total impact, based on analysis of developable land values and the acreage set aside for the RFS. The other major impact, accounting for 4 percent of the total, occurs on Nature Conservancy-managed property known as the Santa Rosa Plateau Ecological Preserve in Riverside County. There the Metropolitan Water District of Los Angeles paid \$16 million toward the purchase of additional lands for the Preserve to help offset impacts to habitat in the Diamond Valley Lake area. The Santa Rosa Plateau Ecological Preserve contains over 3,200 acres of essential habitat for the RFS.
- 19 It is not possible, using available data, to determine exactly how much of preserved land in the areas excluded from designation were preserved for the immediate needs of the RFS, and the

exact date of the habitat purchase or land dedication is also unknown. This analysis, using recent year GIS land use data describing current land uses, seeks to provide a reasonable upper bound for the costs of RFS protection since 1993. In the event that these lands were preserved entirely for non-RFS reasons, a reasonable lower bound estimate of the costs of conservation activities since the listing is zero. However, because the upper bound describes lands that the Service has identified as RFS essential habitat and that have may have been both preserved since 1993, it is likely that at least some land may have been preserved for the RFS.

Table ES-3
U.S. Fish & Wildlife Service
Draft Economic Analysis for Critical Habitat Designation for the RFS
Largest Cost Impacts in Essential Habitat, by Subregion

Habitat Subregion	Cost Impacts Since Listing	Cost Impacts 2005–2024 (high)	Proposed/ Excluded
Otay Mesa (excluded)	\$229,706,000		Excluded
Skunk Hollow/Johnson Ranch	\$71,725,000		Excluded
Schleuniger Pool/Clayton Ranch	\$39,927,000		Excluded
Otay Mesa (proposed)	\$36,513,000		Proposed
Santa Rosa Plateau	\$16,000,000		Excluded
Santa Rosa Plateau		\$64,111,000	Excluded
Saddleback Meadows		\$59,688,000	Proposed
Otay Mesa (excluded)		\$57,711,000	Excluded
Chiquita Ridge		\$44,819,000	Proposed
Cruzan Mesa		\$37,215,000	Proposed

- 20 Information from the public comment period of the DEA is solicited that may more definitively separate RFS conservation costs from costs attributable to other species, and costs of the pre-1993 period from those occurring later. The areas where specific information would be most effective include southwestern Riverside County and Otay Mesa in San Diego County.

POTENTIAL IMPACTS, 2005–2024

- 21 Between 2005 and 2024, RFS-related conservation activities are expected to have an annual impact of between \$3.7 and \$19.5 million for 5,795 acres of proposed lands (\$39 million to \$207 million total for the period). As shown in **Tables ES-1** and **ES-2**, the estimated annual impact for 12,535 acres of excluded lands is between \$2.9 and \$15.2 million (\$31 million to \$161 million total). Landowners with developable land in essential habitat bear the majority of impacts in the next 20 years, as less than 2 percent of the impact total affecting public activities such as airport expansion and road construction. Because of the location of land proposed versus excluded from the designation, impacts for excluded lands are lower than impacts for proposed lands. For comparison purposes, **Table ES-3** reports the habitat subregions with the largest total cost impacts anticipated between 2005 and 2024.
- 22 The characteristics of the land market and anticipated public projects in each habitat subregion contribute to the cost of RFS-related conservation activities on a *per-acre* basis. In **Tables ES-1** and **ES-2**, the impact total over the next 20 years is divided by the acreage of essential habitat for each subregion. Use of the full essential habitat acreage in this metric will average the project-specific costs in areas where economic activities are taking place with the near zero costs of already protected areas. In general, the future costs of actions to protect the species and its habitat in essential habitat acreage are highest in Central Orange County and in Los Angeles County near the City of Santa Clarita (low end: \$12,400 to \$15,800 per acre) and are lowest in Ventura and Southern San Diego Counties (low end: \$700 to \$4,800 per acre). Public lands are significantly lower in cost per acre than areas with private lands.

LAND PROPOSED FOR DESIGNATION

- 23 Five habitat subregions account for 92 percent to 98 percent of the \$39 to \$207 million in total 2005–2024 impacts associated with RFS-related conservation activities:
- Saddleback Meadows (Orange County)
 - Chiquita Ridge (Orange County)
 - Cruzan Mesa (Los Angeles County)
 - Otay Mesa (San Diego County)
 - Tijeras Creek (Orange County)
- 24 Impacts from these sites in particular occur from anticipated real estate development in rapidly growing areas of Southern California. Saddleback Meadows, Chiquita Ridge, and Tijeras Creek are located in a large, master planned area of unincorporated Orange County known as Rancho Mission Viejo. Rancho Mission Viejo consists of numerous planned and several completed development projects tied together by a preferred plan alternative known as the Ranch Plan.

Together, these three areas account for approximately 62 percent to 65 percent (low vs. high) of the total impact between 2005 and 2024 for lands proposed for designation.

- 25 Development activity expected for lands outside of the City of Santa Clarita in an area known as Cruzan Mesa is associated with 17 percent to 18 percent of total impacts. Below Cruzan Mesa in a ranking of impact size, the Otay Mesa subregion of San Diego County generates from 14 percent to 15 percent of the total impact. Specifically, these impacts occur in the southeastern portion of the East Otay Mesa Specific Plan and along the Mexican Border in the City of San Diego. Development of private lands in areas not yet part of the regional HCP known as the MSCP will be accompanied by substantial amounts of land set aside to protect the RFS and its habitat.
- 26 Many factors implicit in the land development market make forecasting the location and acreage of future development very difficult. Rather than attempt to forecast land use over a 20-year period for small areas of cities and counties, the analysis instead examined broader trends in housing unit construction and land use on a regional basis. In general, rates of land consumption for new development on the edges of built communities in Orange, Riverside, and San Diego Counties are at historical highs for each of the habitat subregions described above. Given these conditions in the market, the analysis assumes that, as a reasonable upper bound estimate, 100 percent of developable land in proposed critical habitat will be developed.
- 27 In addition, aside from the Radio Tower Road site that is designated as Open Space in the Orange County General Plan, the protected status of much of the Orange County habitat subregions has not been verified. GIS data from the Orange County Department of Parks, Beaches, and Harbors identified the acreage belonging to O'Neill Regional Park. While this park acreage was removed from the undeveloped land area of the Saddleback Meadows and Tijeras Creek sites, it was not possible to confirm that private landholdings had been dedicated for RFS conservation. Using project modification parameters held constant throughout the DEA, the analysis assumes that part of these sites will be set aside from development but also that the remainder of the acreage will be developed.

LAND EXCLUDED FROM THE DESIGNATION

- 28 Three habitat subregions account for 82 percent to 92 percent of the \$31 million to \$161 million in total 2005–2024 impacts associated with RFS-related conservation activities:
- Santa Rosa Plateau (Riverside County)
 - Otay Mesa (San Diego County)
 - Lake Elsinore (Riverside County)

- 29 Impacts from these sites in particular occur from anticipated real estate development in rapidly growing areas of Southern California. Large tracts of privately owned land are located between the Santa Rosa Plateau Ecological Preserve and the Cleveland National Forest in southwestern Riverside County, and numerous land subdivision activities in the past few years have resulted in the construction of custom homes on 5-, 10-, and 20-acre lots. With a continuation of this trend, RFS-related conservation activities affecting private land to the north and west of the Nature Conservancy-managed property will contribute to between 35 percent and 40 percent of all impacts to excluded lands in the next 20 years. The Santa Rosa Plateau Ecological Preserve itself contains over 3,200 acres of essential habitat for the RFS.
- 30 Second to the Santa Rosa Plateau, the Otay Mesa subregion of San Diego County is expected to generate between 34 percent and 36 percent of the total impact. According to the terms of the regional HCP known as the MSCP, development of private lands in this area of the County will be accompanied by substantial amounts of land set aside to protect the RFS and its habitat. Third largest among the impacts, development activity in the City of Lake Elsinore in the next 20 years accounts for 14 percent to 16 percent of total impacts. The land in its current state is undeveloped, although public improvements have recently been constructed in the areas excluded from designation.
- 31 Many factors implicit in the land development market make forecasting the location and acreage of future development very difficult. Rather than attempt to forecast land use over a 20-year period for small areas of cities and counties, the analysis instead examined broader trends in housing unit construction and land use on a regional basis. In general, rates of land consumption for new development on the edges of built communities in Riverside and San Diego Counties are at historical highs for each of the habitat subregions described above. Given these conditions in the market, the analysis assumes that, as a reasonable upper bound estimate, 100 percent of developable land in excluded critical habitat will be developed.

SMALL BUSINESS IMPACTS

- 32 This report presents an analysis of potential impact to small businesses, using data gathered from the Dun and Bradstreet, the Small Business Administration (SBA), and Robert Morris & Associates on the business characteristics of small land development companies in the five counties. Expressed as a percentage of total sales revenues for all small land development companies in each county in the five-county region, the impact of RFS-related conservation measures is estimated to be as high as 2.8 percent of total revenues for lands proposed for designation and 0.2 percent of total revenues for lands proposed for exclusion.
- 33 This estimate applies to 2005-2024 projects in Los Angeles, Orange, and San Diego Counties on lands proposed for designation and to Riverside and San Diego Counties on lands proposed for exclusion. These impacts, however, assume that 30 percent of all land included in the

designation be set aside for RFS conservation in the event of a proposed project. The actual percentage of land set aside could be as low as five percent of the project acreage. In that case, the impact of RFS-related conservation measures would be an average of 0.5 percent of revenues for each small business in areas proposed for designation or 0.1 percent of revenues in areas proposed for exclusion.

ENERGY INDUSTRY IMPACTS

- 34 Pursuant to Executive Order Number 13211, Federal agencies are required to submit a summary of the potential effects of regulatory actions on the supply, distribution, and use of energy. Two criteria are relevant to this analysis: 1) reductions in electricity production in excess of 1 billion kilowatt-hours per year or in excess of 500 megawatts of installed capacity and 2) increases in the cost of energy production in excess of 1 percent. This proposed critical habitat designation is expected to have minimal impacts on the energy industry.

CAVEATS TO THE ECONOMIC ANALYSIS

- 35 Uncertainty is present in any estimate of impacts from RFS-related conservation activities on past and future real estate development. Available land use data at the county level exists primarily to track developed use categories in the present and for a 20 to 40 year-planning horizon. As such, data describing those areas already developed do not include the date of development, nor does it include the kinds of listed species for which project modifications were undertaken in the project's development. For this reason, this analysis derives many impacts using assumptions that have a low likelihood of understating the impact. These assumptions approximate the amount of land development taking place since the listing, the amount of land being developed in the next 20 years, and the share of total land use regulation impacts attributable to the RFS.
- 36 Moreover, the analysis does not estimate how project modifications undertaken to protect the RFS may reduce costs for the project elsewhere, resulting in a smaller net impact. The example is the land development project in which Federal regulation requires the set aside of habitat acreage on the project site. It is likely that local government regulators, after considering this habitat set aside in the project's overall mix of land uses, will require the project applicant to provide lesser amounts of open space, parks, buffering, or other unimproved land uses. As a result, the net cost of actions taken to protect the RFS may be lower than that predicted here.
- 37 Finally, there is uncertainty in predicting the location or the price of land approved for development beyond a short planning horizon of 2 to 4 years. Impacts occurring beyond this horizon are less certain but still possible, and the value of a large amount of land may be affected by critical habitat designation as cities grow and once rural properties become

impacted by urbanization. Conversely, the exact size of the impact on real estate development becomes less easily estimated as the prices used in the calculation are farther in the future and less connected to transactions in a current real estate market.

- 38 **Table ES-4** presents several key assumptions that introduce uncertainty into this economic analysis, as well as the potential direction and relative scale of bias introduced by the assumption.

ORGANIZATION OF THE REPORT

- 39 This report contains six chapters. **Chapter I** provides background on the designation, the species and its habitat, and major regulations that govern land use impacts to the habitat. **Chapter II** presents the analytic framework of the analysis, including a discussion of the types of economic impacts that are estimated, the time frame of the analysis, and a summary of the analytic steps comprising the analysis. **Chapter III** summarizes the key economic and demographic information for the counties likely to be impacted by the proposed designation, including population and labor force characteristics and sector by sector economic activity.
- 40 **Chapter IV** presents the economic impacts of RFS-related conservation activities on real estate development. In particular, it provides impacts occurring since the listing and potential impacts over the next 20 years, both for lands proposed for designation and lands excluded from designation. A similar format is followed for public economic activities in **Chapter V**, and estimates other kinds of impacts such as those driven by the California Environmental Quality Act (CEQA), project delays, regulatory uncertainty, and stigma are given in **Chapter VI**.

Table ES-4
U.S. Fish & Wildlife Service
Draft Economic Analysis for Critical Habitat Designation for the RFS
Caveats to the Economic Analysis

Key Variables	Effect on Impact Estimate
The analysis does not account for the habitat preserved for reasons unrelated to the RFS or at a point in time before its listing.	-
The analysis does not account for the locations or sizes of vernal pools in the essential habitat areas and adjusts the necessary preserved acreage accordingly.	+/-
The analysis does not assume that developers may satisfy multiple public land use requirements by setting aside RFS habitat on the project site. In reality, projects benefit from claiming that habitat protection provides open space, necessary buffering between incompatible land uses, flood control, and other functions.	-
The rate of change in the price of land may not be uniform across the study area, and real rates of increase during the next 20 years may be above or below the level used in the calculations.	+/-
The quantity and location of development over the next 20 years may produce less than 100 percent buildout of areas planned for development.	-
The analysis does not attempt to calculate the losses in development value that occur to a balanced set of land uses. Because land values are derived from residential prices only, the influence of newly built commercial projects such as shopping centers and office buildings on the estimated impacts is unknown.	+/-
The analysis utilizes the best available existing data, i.e., estimates of impacts from enterprises or agencies with not-yet-planned, completed, or ongoing projects may be missing.	-
Notes: -: Modifying the analysis to reflect the presented information would lower the estimated costs. +: Modifying the analysis to reflect the presented information would raise the estimated costs. +/-: This assumption has an unknown effect on estimates.	

42 **Appendix A** explains the small business impacts and potential energy industry impacts. Basic land use descriptions of each essential habitat subregion are provided in **Appendix B**, and background real estate price calculations are shown in **Appendix C**. Finally, adjustments made to SCAG land use data are detailed in **Appendix D**.

I. REPORT PURPOSE AND ANALYTICAL FRAMEWORK

INTRODUCTION AND BACKGROUND

- 43 The purpose of this analysis is to estimate the economic impact of actions taken to protect the federally listed Riverside fairy shrimp (RFS) and its habitat. It attempts to quantify the economic effects of the designation of critical habitat, as well as any protective measures taken as a result of the listing or other Federal, State, and local laws that aid habitat conservation in the areas proposed for designation. It looks retrospectively at costs that have been incurred since the date the species was listed, and it attempts to predict future costs likely to occur after this proposed designation is finalized.
- 44 The RFS is a crustacean species that inhabits vernal pools in Southern California. Vernal pools, which form each year during the rains of winter and spring and generally dry up during the early summer, are home to a variety of animal and plant species. As a result of the seasonal changes in the habitat, the RFS have adapted to both wet and dry conditions, remaining dormant in cyst form until sufficient rains allow for growth and reproduction. In 1993 the RFS was federally listed by the U.S. Fish and Wildlife Service (Service) as endangered, and in 2000 approximately 12,000 acres were proposed for designation as critical habitat. The final rule reduced the designation to 6,900 acres.
- 45 In October 2002, the United States District Court of the District of Columbia vacated the existing designation and ordered the Service to publish a new final rule. The current proposed designation encompasses 5,795 acres in five units of proposed critical habitat, part of 18,330 acres of essential habitat. Of the 18,330-acre total, 12,535 acres are excluded from the designation. The proposed habitat units are distributed from Ventura County in the north, to Riverside County in the east, through Los Angeles and Orange Counties in the middle, and to San Diego County in the south. The majority of excluded habitat is found in Riverside and San Diego Counties. The majority of lands proposed for designation are located in Orange and San Diego Counties.
- 46 This information is intended to assist the Secretary in determining whether the benefits of excluding particular areas from the designation outweigh the benefits of including those areas in the designation.⁴ In addition, this information allows the Service to address the requirements of Executive Orders 12866 and 13211, and the Regulatory Flexibility Act (RFA), as amended by the Small Business Regulatory Enforcement Fairness Act (SBREFA).⁵ This report also complies

⁴ 16 U.S.C. §1533(b)(2).

⁵ Executive Order 12866, "Regulatory Planning and Review," September 30, 1993; Executive Order 13211, "Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use," May 18, 2001; 5. U.S.C. §§601 *et seq.*; and Pub Law No. 104-121.

with direction from the U.S. 10th Circuit Court of Appeals that, when deciding which areas to designate as critical habitat, the economic analysis informing that decision should include “co-extensive” effects.⁶

APPROACH TO ESTIMATING ECONOMIC EFFECTS

- 47 This economic analysis considers both the economic efficiency and distributional effects that may result from efforts to protect the RFS and its habitat (hereinafter referred to collectively as “RFS conservation activities”). Economic efficiency effects generally reflect “opportunity costs” associated with the commitment of resources required to accomplish species and habitat conservation. For example, if activities that can take place on a parcel of private land are limited as a result of the designation or the presence of the species, and thus the market value of the land is reduced, this reduction in value represents one measure of opportunity cost or change in economic efficiency. Similarly, the costs incurred by a Federal action agency to consult with the Service under section 7 represent opportunity costs of RFS conservation activities.
- 48 This analysis also addresses how the impacts of RFS conservation activities are distributed, including an assessment of any local or regional impacts of conservation activities and the potential effects of conservation activities on small entities and the energy industry. This information can be used by decision-makers to assess whether the effects of conservation activities might unduly burden a particular group or economic sector.
- 49 For example, while habitat conservation activities may have a relatively small impact when measured in terms of changes in national economic efficiency, individuals employed in a particular sector of the economy in the geographic area of the designation may experience relatively greater impacts. The difference between economic efficiency effects and distributional effects, as well as their application in this analysis, are discussed in greater detail below.

EFFICIENCY EFFECTS

- 50 At the guidance of the Office of Management and Budget (OMB) and in compliance with Executive Order 12866 “Regulatory Planning and Review,” Federal agencies measure changes in economic efficiency to understand how society, as a whole, will be affected by a regulatory

⁶ In 2001, the U.S. 10th Circuit Court of Appeals instructed the Service to conduct a full analysis of all of the economic impacts of the designation, regardless of whether those impacts are attributable co-extensively to other causes (*New Mexico Cattle Growers Ass’n v. U.S.F.W.S.*, 248 F.3d 1277 (10th Cir. 2001)).

action.⁷ In the context of regulations that protect RFS habitat, these efficiency effects represent the opportunity cost of resources used or benefits foregone by society as a result of the regulations. Economists generally characterize opportunity costs in terms of changes in producer and consumer surpluses in affected markets.⁸

- 51 In some instances, compliance costs may provide a reasonable approximation for the efficiency effects associated with a regulatory action. For example, a landowner or manager may enter into a consultation with the Service to ensure that a particular activity will not adversely modify critical habitat. The effort required for the consultation represents an economic opportunity cost because the landowner or manager's time and effort would have been spent in an alternative activity had the parcel not been included in the designation. When compliance activity is not expected to significantly affect markets—that is, not result in a shift in the quantity of a good or service provided at a given price, or in the quantity of a good or service demanded given a change in price—the measurement of compliance costs can provide a reasonable estimate of the change in economic efficiency.
- 52 Where RFS conservation activities are expected to significantly impact a market, it may be necessary to estimate changes in producer and consumer surpluses. For example, a designation that precludes the development of large areas of land may shift the price and quantity of housing supplied in a region. In this case, changes in economic efficiency (i.e., social welfare) can be measured by considering changes in producer and consumer surplus in the real estate market.
- 53 This analysis begins by measuring costs associated with measures taken to protect species and habitat. As noted above, in some cases, compliance costs can provide a reasonable estimate of changes in economic efficiency. However, if the cost of conservation measures is expected to significantly impact markets, the analysis will consider potential changes in consumer and/or producer surplus in affected markets.

⁷ Executive Order 12866, "Regulatory Planning and Review," September 30, 1993; U.S. Office of Management and Budget, "Circular A-4," September 17, 2003, available at <http://www.whitehouse.gov/omb/circulars/a004/a-4.pdf>.

⁸ Consumer surplus is the difference between the total value consumers receive from a particular good and the total amount they pay for that good. When the price of a good goes up, consumer surplus falls since a portion of the consumers fall out of the market altogether and the remainder pay a higher price. Producer surplus, alternatively, is the difference between the total market value associated with a particular level of output and the total market costs associated with supplying that level of output. For additional information on the definition of "surplus" and an explanation of consumer and producer surplus in the context of regulatory analysis, see Gramlich, Edward M., *A Guide to Benefit-Cost Analysis* (2nd Ed.), Prospect Heights, Illinois: Waveland Press, Inc., 1990; and U.S. 240-R-00-003, September 2000, available at <http://yosemite.epa.gov/ec/epa/eed.nsf/webpages/Guidelines.html>.

DISTRIBUTIONAL AND REGIONAL ECONOMIC EFFECTS

54 Measurements of changes in economic efficiency focus on the net impact of conservation activities, without consideration of how certain economic sectors or groups of people are affected. Thus, a discussion of efficiency effects alone may miss important distributional considerations. OMB encourages Federal agencies to consider distributional effects separately from efficiency effects.⁹ This analysis considers several types of distributional effects, including impacts on small entities; impacts on energy supply, distribution, and use; and regional economic impacts. It is important to note that these are fundamentally different measures of economic impact than efficiency effects, and thus cannot be added to or compared with estimates of changes in economic efficiency.

Impacts on Small Entities and Energy Supply, Distribution, and Use

55 This analysis considers how small entities, included small businesses, organizations, and governments, as defined by the RFA, might be affected by RFS conservation activities. In addition, in response to Executive Order 13211 “Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use,” this analysis considers the impacts of conservation activities on the energy industry and its customers.¹⁰

REGIONAL ECONOMIC EFFECTS

56 Regional economic impact analysis can provide an assessment of the potential localized effects of conservation activities. Specifically, regional economic impact analysis produces a quantitative estimate of the potential magnitude of the initial change in the regional economy resulting from a regulatory action. Regional economic impacts are commonly measured using regional input/output models. These models rely on multipliers that mathematically represent the relationship between a change in one sector of the economy (e.g., expenditures by households) and the effect of that change on economic output, income, or employment in other local industries (e.g., suppliers of goods and services to households). These economic data provide a quantitative estimate of the magnitude of shifts of jobs and revenues in the local economy.

⁹ U.S. Office of Management and Budget, “Circular A-4,” September 17, 2003, available at <http://www.whitehouse.gov/omb/circulars/a004/a-4.pdf>.

¹⁰ Executive Order 13211, “Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use,” May 18, 2001.

57 The use of regional input/output models in an analysis of the impacts of species and habitat conservation efforts can overstate the long-term impacts of a regulatory change. Most importantly, these models provide a static view of the economy of a region. That is, they measure the initial impact of a regulatory change on an economy but do not consider long-term adjustments that the economy will make in response to this change. For example, these models provide estimates of the number of jobs lost as a result of a regulatory change, but do not consider re-employment of these individuals over time or other adaptive responses by impacted businesses. In addition, the flow of goods and services across the regional boundaries defined in the model may change as a result of the regulation, compensating for a potential decrease in economic activity in the region.

58 Despite these and other limitations, in certain circumstances regional economic impact analysis may provide useful information about the scale and scope of localized impacts. It is important to remember that measures of regional economic effects generally reflect shifts in resource use rather than efficiency losses. Thus, these types of distributional effects are reported separately from efficiency effects (i.e., not summed). In addition, measures of regional economic impact cannot be compared with estimates of efficiency effects, but should be considered as distinct measures of impact.

SCOPE OF THE ANALYSIS

59 This analysis attempts to quantify economic effects of the designation of critical habitat, as well as any protective measures taken as a result of the listing or other Federal, State, and local laws that aid habitat conservation in the

MEASURES OF ECONOMIC IMPACT

Economists measure economic impacts in terms of both efficiency effects and distributional effects. **Efficiency effects** describe net changes in national social welfare, based upon the idea that social welfare can be maximized by using resources in ways that yield the greatest benefits to society. **Distributional effects** often are expressed as “regional economic impacts” (e.g., shifts in employment and economic output) and provide useful information about the scale and scope of localized impacts. Both these measures of economic impact are valid and should be considered in assessing the impact of MSO conservation activities. Efficiency effects and distributional effects are fundamentally distinct measures of economic impact, however, and thus cannot be added together.

Changes in economic efficiency reflect changes in national economic well-being. For example, a rule that limits cattle grazing may result in welfare losses to landowners who can no longer use their land for its highest and best economic use. These losses are not necessarily compensated for by corresponding welfare gains elsewhere in the economy—the landowner is simply worse off. A change in grazing practices also may result in lost jobs or revenues in the local community; the cattle industry may produce additional cattle elsewhere, however, ultimately shifting jobs and revenues into different areas. From a national perspective, losses to a regional economy typically are offset elsewhere once a new equilibrium is established.

Consider a simple example. A recreational angler spends \$35 a day to fish, as reflected in purchases on equipment, lunch, etc., at a favorite site in Town A. Suppose this angler would be willing to pay \$10 over and above the \$35 for a day of fishing at this site. That is, he experiences a \$10 surplus for each day of fishing at this favorite site. Now suppose that this site were closed, and the angler were forced to fish at a less attractive site in Town B, where he spends \$35 but only experiences a \$5 surplus per fishing day. In this case, total consumer surplus losses would equal \$5 (\$10 minus \$5). Town A would lose \$35 in fishing-related expenditures and Town B would gain \$35 in expenditures. While society as a whole breaks even with regard to the \$35, knowing that a particular town is worse off by \$35 may be an important consideration in terms of whether that town is unfairly burdened by the site closure. While both the \$35 regional impact measure and the \$5 efficiency effects measure have important interpretations, the sum (\$40) would not have easy interpretation.

areas proposed for designation. Habitat conservation efforts undertaken to meet the requirements of other Federal, State or local agencies can assist the Service in achieving its goals as set out in section 4(b)(2) of the Act (already defined in previous section). In certain cases, other government entities may work cooperatively with the Service to address natural resource management issues, thereby expediting the regulatory process for project proponents. Because all RFS-related species and habitat protection efforts likely contribute to the efficacy of the proposed RFS critical habitat designation, the impacts of these actions are considered relevant for understanding the full impact of proposed designation.

SECTIONS OF THE ACT RELEVANT TO THE ANALYSIS

- 60 The analysis focuses on activities that are influenced by the Service through sections 4, 7, 9, and 10 of the Act. Section 4 of the Act focuses on the listing and recovery of endangered and threatened species, as well as the designation of critical habitat. In this section, the Secretary is required to designate species as endangered or threatened “solely on the basis of the best available scientific and commercial data.”¹¹ Under section 4(d), the Service writes regulations to provide for the conservation of threatened species. The implementation of these regulations may have economic impacts on resource managers, landowners, and other relevant parties. However, there is no 4(d) rule for the RFS, and thus Section 4 issues are not relevant to this analysis. Impacts associated with section 4(d) are considered in this analysis.
- 61 The protections afforded to threatened and endangered species and their designated habitat are described in sections 7, 9, and 10 of the Act, and economic impacts resulting from these protections are the focus of this analysis:
- Section 7 of the Act requires Federal agencies to consult with the Service to ensure that any action authorized, funded, or carried out will not likely jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of critical habitat. The administrative costs of these consultations, along with the costs of project modifications resulting from these consultations, represent compliance costs associated with the listing of the species and the designation of critical habitat.
 - Section 9 defines the actions that are prohibited by the Act. In particular, it prohibits the “take” of endangered wildlife, where “take” means to “harass, harm, pursue, or collect, or to attempt to engage in any such conduct.”¹² The economic impacts associated with this section manifest themselves in sections 7 and 10.

¹¹ 16 U.S.C. 1533.

¹² 16 U.S.C. 1538 and 16 U.S.C. 1532.

- Under section 10(a)(1)(B) of the Act, a non-Federal entity (i.e., a landowner or local government) may develop a habitat conservation plan (HCP) for an endangered animal species to meet the conditions for issuance of an incidental take permit (ITP) in connection with the development and management of a property.¹³ The requirements posed by the HCP may have economic impacts associated with the goal of ensuring that the effects of incidental take are adequately minimized and mitigated. Federal agencies do not develop HCPs, but instead obtain permission for incidental take through the section 7 consultation process.

ADDITIONAL ANALYTICAL CONSIDERATIONS

- 62 This analysis also considers other types of economic impacts that can be a consequence of RFS critical habitat designation. These may include loss in project value because of stigma, uncertainty, and project delay, as described further below.

STIGMA

- 63 “Stigma” refers to the change in economic value of a particular project or activity because of negative (or positive) perceptions of the role critical habitat will play in developing, implementing, or conducting the project or activity. For example, changes to private property values associated with developer attitudes about the limits and costs of implementing a project in critical habitat are known as “stigma impacts.”

TIME DELAY AND REGULATORY UNCERTAINTY

- 64 Uncertainty and delay represent actual (as opposed to perceived) impacts because of additional risk with regard to the amount, timing, or cost associated with a project or activity. For example, time delays can be caused by the consultation process or compliance with other regulations. Regulatory uncertainty costs can occur in anticipation of having to modify project parameters (e.g., retaining outside experts or legal counsel to better understand their responsibilities with regard to critical habitat).

OTHER IMPACTS

- 65 Under certain circumstances, the designation of critical habitat may provide new information to a community about the sensitive ecological nature of a geographic region, potentially triggering

¹³ U.S. Fish and Wildlife Service, “Endangered Species and Habitat Conservation Planning.” From: <http://endangered.fws.gov/hcp/>, as viewed on August 6, 2002. Sections 9 and 10 of the Act do not apply to plants.

additional economic impacts under other State or local laws. In cases where these costs would not have been triggered “but for” the designation of critical habitat, they are included in this economic analysis. In this regard, the analysis considers the extent to which the RFS designation might trigger the completion of an environmental impact report (EIR) under CEQA.

BENEFITS

- 66 The published economics literature has documented that real social welfare benefits can result from the conservation and recovery of endangered and threatened species. Such benefits also have been ascribed to preservation of open space and biodiversity, both of which can be associated with species conservation but which are not the purpose of critical habitat. Likewise, regional economies and communities can benefit from the preservation of healthy populations of endangered and threatened species, and the habitat on which these species depend.
- 67 In Executive Order 12866, OMB directs Federal agencies to provide an assessment of costs and benefits of a proposed regulatory action.¹⁴ However, in its guidance for implementing Executive Order 12866, OMB acknowledges that often, it may not be feasible to monetize, or even quantify, the benefits of environmental regulations.¹⁵ Where benefits cannot be quantified, OMB directs agencies to describe the benefits of a proposed regulation qualitatively. *Given the limitations associated with estimating the benefits of the proposed designation for RFS habitat, the Service believes that the benefits of the proposed rule are best expressed in biological terms that can be weighed against the expected cost impacts of the rulemaking.*

ANALYTIC TIME FRAME

- 68 The analysis looks prospectively at future costs associated with the listing, critical habitat, and other related RFS protections. The analysis examines economic impacts based on activities that are “reasonably foreseeable,” including but not limited to activities that are currently authorized, permitted, or funded, or for which proposed plans are currently available to the public. In addition, the analysis looks retrospectively at all costs that have occurred since the time that the RFS listing was finalized in August, 1993. Accordingly, the analysis bases estimates on activities that span the 1993 to 2024 time frame (2024 being 20 years from the time of habitat designation).

¹⁴ Executive Order 12866, “Regulatory Planning and Review,” September 30, 1993.

¹⁵ U.S. Office of Management and Budget, “Circular A-4,” September 17, 2003, available at <http://www.whitehouse.gov/omb/circulars/a004/a-4.pdf>.

INFORMATION SOURCES

- 69 The primary sources of information for this report were communications with and data provided by personnel from the Service, city and county parks and planning departments, regional planning agencies, regional transit agencies, base decommissioning agencies, homebuilders and developers active in Southern California, and land conservancies. Specifically, the analysis relies on data collected in communication with personnel from the following entities.
- Lennar Communities;
 - San Diego Association of Governments (SANDAG);
 - Southern California Association of Governments (SCAG);
 - The Nature Conservancy;
 - Center for Natural Lands Management;
 - Planning Departments of the Cities of Moorpark, Thousand Oaks, and Simi Valley;
 - U.S. Navy Southwest Division;
 - North County Transit Service;
 - Orange County Department of Planning and Harbors, Beaches and Parks Department;
 - March Air Force Base (AFB) Joint Powers Authority (JPA).
- 70 This analysis also relies upon publicly available documents including the Multi-Species Conservation Plan, the Western Riverside Multiple Species Habitat Conservation Plan, the Ranch Plan for Rancho Mission Viejo, previously issued Critical Habitat and Recovery Plan regulations issued by the Service for the RFS, and the Draft EIR/Environmental Impact Statement (EIS) for the Los Angeles World Airport (LAX) Master Plan for 2015. Publicly available map and real estate data also were used to augment the analysis. Please refer to the reference section at the end of this document for a full list of sources of information relied upon.

II. SPECIES, HABITAT, AND REGULATORY CONTEXT

- 71 This chapter presents background information on the RFS, vernal pool habitat, and major land use regulations that apply to both public and private economic activities occurring in or near vernal pool watersheds. Using biological information provided by the Service, the discussion below briefly explains the habitat requirements of the species and outlines the RFS-related listing and critical habitat rules promulgated by the Service during the past decade. The chapter also describes the areas in five Southern California counties that the Service proposed in April 2004 as critical habitat and areas the Service has excluded from the proposed designation.

SPECIES AND HABITAT

THE RIVERSIDE FAIRY SHRIMP

- 72 The RFS is a small freshwater crustacean whose populations are found in Ventura, Los Angeles, Orange, Riverside, and San Diego Counties.¹⁶ The species is distinguished from similar species by its red colored cercopods (anterior appendages) which occur on all of the ninth and 30 to 40 percent of the eighth abdominal segments. Adult fairy shrimp may grow to a length of 13 to 25 millimeters (mm) and are presumed to feed on algae, bacteria, protozoa, rotifers, and bits of organic matter. RFS are preyed upon by a wide variety of wildlife, including beetles, dragonfly larvae, and other arthropods, frogs, salamanders, toad tadpoles, shorebirds, ducks, and other migratory birds.

VERNAL POOL ECOSYSTEMS

- 73 Vernal pools have a discontinuous occurrence in several regions of California, from as far north as the Modoc Plateau in Modoc County, south through San Diego County to the international border with Mexico. Vernal pools have a wet phase and a dry phase which make vernal pools ecosystems unique from both perennial wetland ecosystems and upland ecosystems. As a result, a unique and highly endemic ecosystem is associated with vernal pool habitat.
- 74 Most of the species associated with vernal pools reside in the vernal pool basin or the area that holds water. However, the presence of the surrounding watershed is also a vital component of a vernal pool ecosystem. The term *watershed* is commonly associated with riverine drainages, however, in the context of this discussion the term refers to the land surrounding a single vernal pool or vernal pool complex that contributes to the hydrology of the vernal pools. These watersheds can vary in size from a few hundred square meters to much larger areas around the vernal pools. The watershed and upland area functions to fill the vernal pool basins with water and to provide habitat for animals that rely on the vernal pool for food and water. In addition

¹⁶ Proposed Designation of Critical Habitat for the Riverside Fairy Shrimp, 69 FR 23024, April 27, 2004.

the watershed area affects the water quality of the vernal pool and regulates the vernal pool's water chemistry.

- 75 Vernal pools occurrences are closely linked with specific soil types. The soil types associated with vernal pools have a nearly impermeable surface or subsurface soil layer with a flat or gently sloping topography. Because of local topography and geology, the pools are usually clustered into pool complexes. Pools in a complex are typically separated by distances on the order of meters, and may form dense, interconnected mosaics of small pools or a sparser scattering of larger pools.
- 76 RFS also may be found in disturbed vernal pool habitats where basins have been compacted or artificially deepened and, therefore, hold water for longer periods of time. Although basins supporting populations often appear to be artificially created or enhanced, such basins are located in soils that are capable of seasonal ponding and are often surrounded by naturally occurring vernal pool complexes. These "artificial basins" function in the same manner as naturally occurring vernal pools by filling with late fall, winter and/or spring rains that gradually dry up during the spring and/or summer.

LAND USE REGULATION RELATED TO THE SPECIES

PREVIOUS FEDERAL ACTION RELATED TO CRITICAL HABITAT

- 77 The Service proposed the listing of the RFS as an endangered species in the Federal Register on November 12, 1991 (56 FR 57503).¹⁷ Because the species was not identified until 1985, and its existence remained known only to a few scientists until 1988, the proposed rule constituted the first Federal action on the RFS. The Service published the final rule to list the RFS as endangered in the Federal Register on August 3, 1993 (58 FR 41384). In 1998, the Vernal Pools of Southern California Recovery Plan (Recovery Plan) was finalized. This Recovery Plan provides a list of conservation measures needed to meet the recovery needs of the RFS.
- 78 At the time of listing, the Service concluded that designation of critical habitat for the RFS was not prudent because such designation would not benefit the species. On June 30, 1999, the Southwest Center for Biological Diversity filed a lawsuit in Federal District Court for the Northern District of California for the Service's failure to designate critical habitat for the RFS. On February 15, 2000, the Service entered into a settlement agreement with the plaintiff. Under this settlement, a final determination of critical habitat was to be completed by May 1, 2001.

¹⁷ From the Endangered and Threatened Wildlife and Plants Final Designation of Critical Habitat for the Riverside Fairy Shrimp; Final Rule, 66 FR 29384, May 30, 2001, and the Proposed Designation of Critical Habitat for the Riverside Fairy Shrimp, 69 FR 23024, April 27, 2004.

Subsequently, the plaintiffs agreed to the Service's request to extend this deadline to May 22, 2001.

79 The proposed rule designating critical habitat for the RFS was published on September 21, 2000 (65 FR 57136). In the proposal, the Service determined that it was prudent to designate approximately 12,060 acres of lands in Los Angeles, Orange, San Diego, Riverside, and Ventura Counties as critical habitat. The final designation of critical habitat was published on May 30, 2001 (66 FR 29384). At this time the Service designated a total of 6,870 acres in Los Angeles, Orange, San Diego, Riverside, and Ventura counties as critical habitat.

80 On November 6, 2001, the Building Industry Legal Defense Foundation, Foothill/Eastern Transportation Corridor Agency, National Association of Home Builders, California Building Industry Association, and Building Industry Association of San Diego County filed a lawsuit in the United States District Court for the District of Columbia against the Service challenging the designation of RFS critical habitat and alleging errors by the Service in promulgating the final rules. On March 13, 2002, the Court granted the request of the Center for Biological Diversity, Inc. and Defenders of Wildlife, Inc. to intervene as defendants in the case. The Service requested a voluntary remand and on October 30, 2002, the Court vacated the designation and ordered the Service to publish a new final rule with respect to the designation of critical habitat for the RFS.

NEW PROPOSED DESIGNATION OF CRITICAL HABITAT

81 On April 27, 2004, the Service proposed to designate approximately 5,795 acres of critical habitat in Ventura, Los Angeles, Orange, Riverside, and San Diego Counties in the State of California for the RFS (*Streptocephalus woottoni*). As shown in **Table 1**, another 12,535 acres in the same counties are excluded from this proposed designation. Together, the lands proposed for designation and lands excluded from the proposed designation make up 18,330 acres of essential habitat for the RFS.

82 Areas proposed for designation are divided into 5 different units. Unit 1 contains approximately 1,045 acres. Its habitat subregions include Carlsberg Ranch in Ventura County and Cruzan Mesa in Los Angeles County. One portion of the Carlsberg Ranch subregion, on the edge of the city of Moorpark, has already been largely developed by Lennar Homes. The southeastern portion, Tierra Rajada, lies between the cities of Thousand Oaks and Simi Valley, with a substantial portion falling in Ventura County lands. Cruzan Mesa is on the northeastern edge of the City of Santa Clarita, and contains a residential development by Pardee Homes. Unit 1 represents that northernmost habitat of the RFS habitat.

83 Unit 2 contains approximately 3,086 acres of lands proposed for designation, and the land is both publicly and privately owned. Public lands or projects in Unit 2 include vernal pools in

the vicinity of LAX in Los Angeles County, Marine Corps Base (MCB) Camp Pendleton in San Diego County, and the former Marine Corps Air Station El Toro in Orange County. Other public lands include O'Neill Regional Park in Orange County that spans both the Saddleback Meadows and Tijeras Creek subregions.

- 83 Portions of Saddleback Meadows have been proposed for private development in the last decade, including the Live Oak Plaza commercial development and the Saddleback Meadows residential development. The Saddleback subregion has historically been used for grazing and agriculture. The Tijeras Creek, Chiquita Ridge, and Radio Tower Road subregions all fall in unincorporated Orange County, and are all privately owned. Proposed or active development projects are located in close proximity to both the Tijeras Creek and Chiquita Ridge subregions.
- 84 Unit 3 contains approximately 146 acres of habitat proposed for designation. All vernal pools included in this unit are in Riverside County. All designated lands are located on the former March AFB in the City of Moreno Valley and on the southern edge of the City of Banning.
- 85 Unit 4 contains approximately 397 acres of habitat proposed for designation in San Diego County, and includes some of the vernal pools found on MCB Camp Pendleton as well as the Poinsettia Lane Train Station vernal pool area in the City of Carlsbad.
- 86 Unit 5 contains 1,120 acres that are proposed for designation, all located in the City or County of San Diego. Some of this land is located in the federally owned area known as Arnie's Point along the border with Mexico, and most of the remainder is in East Otay Mesa, an area of major commercial and residential growth. Unit 5 is the southernmost extent of RFS habitat.
- 87 **Appendix B** contains descriptive information about the lands excluded from the designation.

OTHER FEDERAL REGULATION: 404(B)(1) WETLANDS FILL PERMITS

Section 404 of the Clean Water Act (CWA) establishes a program to regulate the discharge of dredged and fill materials into waters of the United States, including wetlands. Activities in waters of the United States that are generally regulated under this program include fills for development, water resource projects (such as dams and levees), infrastructure development (such as highways and airports), and conversion of wetlands to uplands for farming and forestry. Because RFS reside in such wetland areas, impact to the RFS often is subject to CWA regulation in addition to the Act's regulation.

The basic premise of the program is that no discharge of dredged or fill material can be permitted if a practicable alternative exists that is less damaging to the aquatic environment or

Table 1
U.S. Fish & Wildlife Service
Draft Economic Analysis for Critical Habitat Designation for the RFS
Total Acres of Essential Critical Habitat by County [1]

Planning Agency / County	Unit(s) From Proposed Rule	Proposed for Designation	Excluded from Designation
		<i>acres</i>	<i>acres</i>
Southern California Association of Governments (SCAG)			
Ventura	1	511.5	0.0
Los Angeles	1,2	637.5	0.0
Orange	2	2,482.5	84.1
Riverside	3	145.8	5,802.1
Subtotal SCAG Counties		3,777.3	5,886.2
San Diego Association of Governments (SANDAG)			
San Diego [2]	2,4,5	2,017.5	6,648.7
TOTAL SCAG AND SANDAG		5,794.8	12,534.9

"rfs_acres_sum"

Source: U.S. Fish and Wildlife Service

[1] The April 27, 2004 RFS Critical Habitat Designation Proposed Rule (69 FR 23024) references 18,330 essential habitat acres in the five counties identified in this analysis.

[2] Includes 4,645 acres of Otay Mesa and East Otay Mesa lands.

if the nation's waters would be significantly degraded. For this reason, real estate development projects planned in wetland areas require permits from the United States Army Corps of Engineers (USACE) under CWA section 404. When land developers apply for a permit, they must show that they have taken steps to avoid wetland impacts where practicable, minimized potential impacts to wetlands, and provided compensation for any remaining, unavoidable impacts through activities to restore or create wetlands.

- 89 Regulated activities are controlled by a permit review process. An individual permit is usually required for potentially significant impacts. However, for discharges that will have only minimal adverse effects, the USACE often grants up-front general permits. These may be issued on a nationwide, regional, or State basis for particular categories of activities (for example, minor road crossings, utility line backfill, and bedding) as a means to expedite the permitting process. Section 404(f) exempts some activities from regulation under Section 404, including many ongoing farming, ranching, and silvicultural practices.
- 90 Most land development projects are too large to qualify for a general fill permit issued by the USACE, making the project's determination of whether a practicable alternative exists that is less damaging to the aquatic environment a mandatory analysis. In practical terms, meetings are held between the project proponent and USACE officials to negotiate conditions that allow the project to fill or modify wetlands. The outcome of these meetings and the alternatives analysis is that the project must implement a combination of one or more measures to receive the 404 permit: wetlands avoidance, off-site preservation, or on- or off-site wetlands creation.
- 91 Avoidance, also called on-site preservation or land set aside, refers to the act of leaving wetlands in a natural state where they occur on the project site. Off-site preservation is a mechanism to protect wetlands in a location removed from the project site, either through purchasing land in conservation banks that sell protected natural wetland areas as a business or through purchasing qualified land owned by someone who has natural wetlands and is willing to sell a portion of the property or a conservation easement. A third mechanism, wetlands creation, can mean that a land developer will set aside a qualified amount of land on-site that is suitable for the construction of functioning wetlands, purchase and manage suitable vernal pool habitat off-site and construct artificial wetlands there, or purchase artificial wetlands and the necessary stewardship services through a conservation bank located off-site.

STATE REGULATION: THE CALIFORNIA ENVIRONMENTAL QUALITY ACT

- 92 California Environmental Quality Act (CEQA) is a California State statute that requires State and local agencies (known here as "lead agencies") to identify the significant environmental impacts of their actions and to avoid or mitigate those impacts, if feasible. Projects carried out by Federal agencies are not subject to CEQA provisions. CEQA regulations require a lead agency to initially presume that a project will result in a potentially significant adverse

environmental impact and to prepare an EIR if the project may produce certain types of impacts, including when

*[t]he project has the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of an endangered, rare, or threatened species, or eliminate important examples of the major periods of California history or prehistory.*¹⁸

- 93 State law instructs the lead agency (typically a county or city community development or planning department in the case of land development projects) to examine impacts from a very broad perspective, taking into account the value of animal and plant habitats to be modified by the project. The lead agency must determine which, if any, project impacts are potentially significant and, for any such impacts identified, whether feasible mitigation measures or feasible alternatives will reduce the impacts to a level less than significant. It is within the power of a lead agency to decide that negative impacts are acceptable in light of economic, social, or other benefits generated by the project.
- 94 Projects without a mandatory finding of significance and in which the applicant finds no significant impact according to CEQA regulations may be approved by a lead agency in what is known as a negative declaration. Alternative project scenarios are not examined in a negative declaration, and the expenditures are typically much lower than what would be required to complete an EIR.
- 95 Alternatively, an applicant may request that a lead agency issue a permit or some other discretionary approval for a project that is redesigned to either avoid or mitigate all impacts to the environment. Typically, the project is accompanied by mitigation measures in the form of a mitigation negative declaration. Similar to a negative declaration, the expenditures required for the approval of a project with a mitigated negative declaration are on average much lower than costs associated with an EIR.
- 96 Finally, minor projects that fit one of eleven classifications as defined by the CEQA statutes may be found to have no significant effect on the environment. Some of these classifications are listed here:
- Certain alterations of existing facilities
 - Replacement or reconstruction of existing structures
 - Smaller development projects such as restaurants smaller than 2500 square feet
 - Certain projects involving landscaping or temporary trenching

¹⁸ California Natural Resources Code §15065(a).

- Lot line adjustments
- Experimental management or research
- Habitat restoration
- Certain safety inspections and mortgage lending
- Signs and small parking lots

97 Many of these types of minor projects are eligible for a categorical exemption from the provisions of CEQA altogether, and project applicants usually have minimal costs to comply with the paperwork required with the lead agency.

98 Projects sited in or adjacent to vernal pool habitat, depending on the features of the project and the biological resources present on the project site, may move through the project approval process using any of the three CEQA levels of review outlined above:

- EIR
- Negative Declaration or Mitigated Negative Declaration
- Categorical Exemption.

99 Projects experience a wide range of cost impacts because of CEQA, as it is within the power of a the lead agency to decide that negative impacts are acceptable in light of economic, social, or other benefits generated by the project.

HCPS AND LOCAL ORDINANCES

100 The Multiple Species Conservation Plan (MSCP) is a long range, regional development and conservation plan covering nine jurisdictions in Southwestern San Diego County. As an approved regional HCP, the MSCP offers participating jurisdictions the ability to receive section 10 ITPs for all species covered by the MSCP. The MSCP was approved by the Service and the participating jurisdictions in 1997.

101 The MSCP was also created pursuant to the state's Natural Communities Conservation Plan (NCCP) Act, which was passed in 1991. The NCCP began as a pilot program encompasses 59 local southern California government jurisdictions, with a primary focus to conserve coastal sage scrub habitat. In addition to listed species, species not listed by either the Federal Endangered Species Act (Act) or the California Endangered Species Act are included as targets in the plans in an effort to pro-actively conserve these species and prevent their listings.

102 Through the NCCP process, local jurisdictions have worked with the State and Federal governments to do regional land-use planning aimed at proactively addressing expected conflicts between land development and habitat preservation. Conflict was expected because of

the listing of the California gnatcatcher, the listings of other species soon after, and the continuing expansion of real estate development in Southern California.

- 103 The planning regions can obtain ITPs for the species deemed adequately covered by the plan. Political jurisdictions designate which lands will be developed within the lifetime of the plan and which lands will function as preserves. The political jurisdiction then obtains the Federal section 10 permits and State permits, and all landowners in the plan area are restricted as to the land that can be developed. This third party beneficiary method allows local jurisdictions to plan in advance for take levels, and it prevents private individuals from being required to develop HCPs for activities already included in the NCCP.
- 104 The City of San Diego developed the MSCP, which serves as an umbrella plan for nine sub-area plans throughout southwestern San Diego County. The sub-areas consist of cities or unincorporated areas in San Diego County. Each sub-area developed, or is in the process of developing, its own land-use plan, which meets the goals of the NCCP program, the City's MSCP, and the State and the Act's requirements for ITPs. The San Diego MSCP covers eighty-five listed and unlisted species in a variety of habitats, including the RFS and vernal pool habitats in particular.
- 105 The next two subsections outline some of the regulatory processes functioning in the MSCP that apply in particular to development projects sites found in RFS essential habitat. The affected jurisdictions are the City and County of San Diego.

Critical Habitat Subunits in the City of San Diego

- 106 Development in the City of San Diego is subject to land use regulations at the Federal, state, and local level. The regulatory pathway for projects involving vernal pool habitat and similar wetlands, however, is uncertain. There is ongoing litigation between the Service and other parties to the MSCP that seeks to determine whether the MSCP authorizes the City of San Diego to provide take of vernal pool species when the USACE does not assert jurisdiction over vernal pool wetlands impacted by a project. There is no general pattern of USACE action in these cases. However, in Southern California, the USACE has in the past ruled certain wetlands to not be jurisdictional when the wetlands were isolated and not tributaries to other creeks or streams.
- 107 When this litigation is concluded, these projects may begin to receive take permits through an MSCP process when a Federal nexus is not present. Alternatively, other regulatory pathways may be prescribed.
- 108 In the absence of a defined role for the MSCP, however, other regulations are in effect. The City's Land Development Code,¹⁹ and the Environmentally Sensitive Lands Ordinance in

¹⁹San Diego Municipal Code §143.0141 (amended October 1999; effective January 2000).

particular, requires that projects with potential impacts to vernal pool habitat be designed according to a three-part process that first emphasizes avoidance, then minimization, and, if necessary, mitigation of negative effects on the RFS.

- 109 Inside the areas designated for preservation by the MSCP, also known as the Multiple Habitat Planning Area or MHPA, city code favors avoidance of impacts to vernal pools. Furthermore, any deviation from development regulations must achieve a project with a no-net-less outcome with retention of in-kind wetland values. Outside the MHPA, projects may choose from a variety of measures that mitigate for habitat impacts, including enhancement, restoration, or transplantation of vernal pools and their species.
- 110 When mitigation is a chosen measure, the City's Biology Guidelines, a part of the City's Land Development Code, stipulate that applicants must achieve a mitigation ratio between 2:1 and 4:1 for vernal pool impacts.²⁰ The Environmentally Sensitive Land Ordinance (ESLO) was adopted in late 1997, while the guidelines were adopted in late 1999. Both likely will apply to all projects in the City during the next 20 years.
- 111 Project applicants who propose projects in compliance with the ESLO and the Biology Guidelines then will undergo CEQA review. The City may conditionally accept the applicant's CEQA responses to project impacts, pending completion of a section 7 consultation or the creation of an individual HCP.²¹ A project applicant typically will offer CEQA mitigation alternatives in a way that meets both ESLO and Service (section 7 or HCP) objectives. As a result, the project's actual mitigation costs are likely to be set at the level required by the most stringent level regulation, whether local or Federal in origin.
- 112 In projects where no Federal nexus is present, however, CEQA assessment of impacts and the required measures to avoid or mitigate those impacts will not refer to the results of a section 7, but instead to local requirements only.

Critical Habitat Subunits in Unincorporated San Diego County

- 113 Projects proposed for unincorporated areas of San Diego County, if located in areas governed by the MSCP, are either part of the MSCP reserve area known as the MHPA or must be added to the MHPA through a major or minor amendment process governed by the MSCP. Similarly, for areas that will be governed by a North County MSCP (likely to be enacted in the next 2–4 years), project areas not included in the habitat preserve must be added by an amendment process.

²⁰*Biology Guidelines*, part of the Land Development Code, San Diego Municipal Code, Table 2: "Wetlands Mitigation Ratios."

²¹Personal communication with Holly Chong, Planning Department, City of San Diego, March 21, 2003.

- 114 County officials believe that both the MSCP and the regional plan that will become the North County MSCP do not provide for take of the RFS. However, other county, state, and Federal regulations apply to projects with impacts to RFS's habitat while the applicant seeks County entitlements for the project.
- 115 Also, San Diego County is preparing an update to its General Plan and is expected to adopt this update, known as General Plan 2020, in the year. Policies regarding vernal pools have not yet been drafted, and no information is available that might indicate whether future land use regulation by the County will be different from the recent past. As a result, this RFS analysis is based on regulatory practices from the recent past.
- 116 According to the County's Land Use and Environment Department, when a project is located in the MHPA or in the future North County habitat preserve, San Diego County's Biological Mitigation Ordinance (BMO) defines the project modifications required before the project can be authorized. This ordinance requires that tiered mitigation based on biologically core resource areas be performed for loss of vernal pool habitat.²² In practice, applicants agree to protect or restore 1 to 3 acres of vernal pool habitat for each acre filled by a development project located in the MHPA or future North County preserve. This regulatory standard for San Diego County predates and operates independently of the section 7 process.
- 117 When a project is located outside the MHPA or the habitat preserve envisioned for the North County MSCP, an applicant must ask for an amendment of the preserve boundary. In some cases, this amendment is minor and requires involvement by the County of San Diego and, through comments made during the County's CEQA process, the State and Federal wildlife agencies. In other cases, the amendment requires Federal rulemaking and the agreement of the original signatories to the MSCP or the North County MSCP, including State and Federal agencies.²³ Each amendment subjects the project to CEQA and an administrative section 7 consultation.
- 118 For projects located outside the MHPA or the habitat preserve envisioned for the North County MSCP, the project is subject to the County's Resource Protection Ordinance (RPO) prohibiting all grading, filling, construction, or placement of structures in vernal pool wetlands unless the economic use of the property is precluded by such a restriction.²⁴ Until the North County MSCP is adopted, the RPO plays an important role in this analysis' treatment of section 7 consultations. Projects located in the North County subregion must consult with the Service when the project takes place on Federal land or when a Federal agency funds or issues permits

²²*Biological Mitigation Ordinance*, Attachment M or "Table of Mitigation Ratios," as revised by the San Diego County Board of Supervisors, October 2000.

²³Personal communication with Tracy Cline, Land Use and Environment Department, County of San Diego, San Diego, California, April 2, 2003.

²⁴*The Resource Protection Ordinance*, Article 4, adopted by the San Diego County Board of Supervisors, October 1991.

for the project. In San Diego County, private landowners will need Federal permits only when the USACE assumes jurisdiction over wetlands impacted by the project. USACE officials estimate that no more than 75 percent of projects impacting vernal pools will be considered jurisdictional.

- 119 Projects without a Federal nexus may pursue an individual HCP for the SDFS under section 10(a) of the Act if the project may result in take of the species. While section 7 consultations may be completed or an individual HCP prepared by the applicant in the North County subregion, the RPO would require equivalent project modifications in the absence of any Federal regulation. That is, the County's RPO asks for a range of 1 to 3 acres protected or restored for each acre filled by the development.²⁵ Hence, costs stemming from the RPO are included in the cost estimates presented in this analysis.

²⁵Personal Communication with Susan Wynn, Listing Branch, Carlsbad Fish & Wildlife Office, Carlsbad, California, April 2, 2003.

III. SOCIOECONOMIC CONTEXT

- 119 This chapter summarizes key economic and demographic information for the counties containing RFS essential habitat. Because the Draft Economic Analysis (DEA) will screen for both regional and landowner-specific impacts, the economic and demographic information presented in this section will be at a regional level to provide the necessary context for specific habitat subregions in the county. The counties impacted by the proposed designation include (from north to south) Ventura County, Los Angeles County, Orange County, Riverside County, and San Diego County.
- 120 For each county, summary descriptions are presented for population and labor force characteristics, population growth rates, and sector by sector job growth or decline. More site-specific information concerning land uses (but not population or employment) for areas proposed for designation or excluded from the designation can be found in **Appendix B**.

ECONOMIC DATA

- 121 Woods and Poole Economics, Inc., based in Washington D.C., collects an extensive variety of data for urban regions (such as the U.S. Census Bureau–defined Primary Metropolitan Statistical Area [PMSA] and Metropolitan Statistical Area [MSA]) throughout the United States, providing both past data and future projections. In some instances, the urban area is as large as the entire county. Counties with significant social or economic connection are sometimes grouped together to form a single PMSA. For example, the urban region containing Riverside and San Bernardino Counties has been combined into the Riverside-San Bernardino PMSA.

POPULATION AND LABOR FORCE

- 122 Los Angeles County, with a population of over 9.7 million people in 2003, is far and away the most highly populated PMSA included in this analysis. As shown in **Table 2**, Los Angeles County alone holds a total labor force of over 4.3 million.²⁶ It is also the PMSA with the lowest projected growth rate (just under half a percent per year), however, and is expected to gain less than 1 million additional residents by 2025 (see **Table 3**). Los Angeles County’s 8.2-percent unemployment rate is the highest of all counties examined, more than 1 percent higher than the statewide average.

²⁶ 2000 Census, U.S. Census Bureau, Department of Commerce. This labor force and unemployment data from the 2000 Census is provided on an individual county level.

Table 2
U.S. Fish & Wildlife Service
Draft Economic Analysis for Critical Habitat Designation for the RFS
Labor Force and Population Characteristics of Counties with RFS Habitat and the State of California

County/State	Labor Force [1]	Unemployment Rate [2] [3]	Ethnicity [4]					Percent of Pop. 25 Yrs and Older [5]			
			White	Hispanic	Asian	Black	Other	with High School Degree Only	with Associates Degree	with Bachelors Degree	with Advanced Degree [6]
Ventura County	372,020	5.2%	73.3%	33.4%	6.5%	2.4%	19.7%	19.7%	7.9%	17.4%	9.5%
Los Angeles County	4,312,264	8.2%	52.8%	44.6%	13.1%	10.5%	26.9%	17.5%	7.8%	20.4%	10.4%
Orange County	1,411,901	5.0%	68.3%	30.8%	14.9%	2.1%	17.1%	17.5%	7.8%	20.4%	10.4%
Riverside County	654,387	7.5%	69.3%	36.2%	4.6%	7.0%	21.2%	24.7%	6.9%	10.7%	5.9%
San Diego County	1,407,152	5.9%	70.3%	26.7%	10.5%	6.6%	15.1%	19.9%	7.6%	18.7%	10.9%
State of California	15,977,879	7.0%	63.4%	32.4%	12.3%	7.4%	19.4%	20.1%	7.1%	17.1%	9.5%

"lbr_force"

Source: United States Census, 2000

[1] Includes population over age 16 in both military and civilian employment.

[2] Unemployment is calculated using civilian employment only.

[3] The U.S. Census unemployment figures consider a person unemployed only if he or she has been actively seeking work within 4 weeks of the date of sample collection. Therefore, the actual number of unemployed persons can be expected to be higher.

[4] Ethnicity data applies to entire population, not just the labor force.

[5] Indicates highest degree achieved.

[6] Includes a master's, professional, or doctorate degree.

Table 3
U.S. Fish & Wildlife Service
Draft Economic Analysis for Critical Habitat Designation for the RFS
Population, Employment, and Average Household Income of MSAs in RFS Habitat

Item	Historical		Current	Projected		Avg. Yearly Change		Avg. Ann. Growth Rate	
	1990	2000	2003	2015	2025	1990 to 2003	2004 to 2025	1990 to 2003	2004 to 2025
Population									
Ventura [1]	670,100	757,300	794,300	923,900	1,039,600	9,554	11,150	1.3%	1.2%
Los Angeles [2]	8,878,200	9,549,400	9,717,900	10,083,100	10,501,700	64,592	35,627	0.7%	0.4%
Orange [3]	2,419,000	2,857,300	2,984,300	3,499,300	3,956,700	43,485	44,200	1.6%	1.3%
Riverside [4]	2,630,500	3,281,200	3,568,300	4,498,900	5,302,800	72,138	78,841	2.4%	1.8%
San Diego [5]	2,512,400	2,825,600	2,963,900	3,526,000	4,026,400	34,731	48,295	1.3%	1.4%
Employment									
Ventura [1]	329,600	402,600	426,400	508,900	562,800	7,446	6,200	2.0%	1.3%
Los Angeles [2]	5,355,400	5,512,700	5,623,800	6,138,700	6,658,600	20,646	47,036	0.4%	0.8%
Orange [3]	1,580,000	1,871,000	1,959,600	2,349,200	2,708,300	29,200	34,032	1.7%	1.5%
Riverside [4]	1,011,600	1,379,600	1,463,200	1,840,600	2,200,000	34,738	33,491	2.9%	1.9%
San Diego [5]	1,438,100	1,733,900	1,819,800	2,191,400	2,522,900	29,362	31,959	1.8%	1.5%
Average Household Income									
Ventura [1]	\$68,200	\$97,500	\$105,300	\$163,700	\$244,400	\$2,854	\$6,323	3.4%	3.9%
Los Angeles [2]	\$64,200	\$88,500	\$94,900	\$150,200	\$235,400	\$2,362	\$6,386	3.1%	4.2%
Orange [3]	\$73,700	\$105,000	\$113,200	\$178,100	\$277,000	\$3,038	\$7,445	3.4%	4.2%
Riverside [4]	\$53,600	\$72,100	\$76,500	\$118,500	\$184,100	\$1,762	\$4,891	2.8%	4.1%
San Diego [5]	\$57,600	\$89,500	\$96,000	\$148,600	\$228,900	\$2,954	\$6,041	4.0%	4.0%

"all_counties"

Source: Woods and Poole 2003

- [1] Ventura PMSA includes Ventura County.
- [2] Los Angeles PMSA includes Los Angeles County.
- [3] Orange PMSA includes Orange County.
- [4] Riverside PMSA includes Riverside and San Bernadino Counties.
- [5] San Diego MSA includes San Diego County.

- 124 The Riverside-San Bernardino PMSA, with the second largest population at 3.6 million and a labor force of approximately 650,000²⁷, has the second highest unemployment rate at 7.5 percent and is expected to see the majority of the growth of the regions examined, with a growth rate of almost 2 percent per year, gaining almost 2 million people by 2025. It has also grown the most in the recent past, with a growth rate of 2.4 percent per year since 1990.
- 125 The Ventura PMSA (with a population of 800,000 and a labor force of approximately 375,000 people), the Orange MSA (population 3 million, labor force approximately 1.4 million), and the San Diego MSA (population 3 million, approximately 1.4 million in the labor force) are all expected to see growth rates of around 1.3 percent per year until 2025, and have unemployment rates in the 5-percent-to-6-percent range.

INCOME AND EDUCATION

- 126 At \$113,000, the Orange MSA has the highest recorded average annual household income of the regions examined, followed closely by the Ventura PMSA at \$105,000. The Los Angeles PMSA and San Diego MSA both fall in the \$95,000-per-year range. The Riverside PMSA, however, is significantly lower, with an average annual household income of just over \$76,000, approximately three-quarters that of the average of the other included MSAs.
- 127 The Riverside-San Bernardino MSA has also seen the lowest growth in average annual household income in the past 14 years, at just 2.8 percent per year. Its projected future average annual income growth rate, however, is similar to that of the other P/MSAs examined, as all are expected to see annual increases of approximately 4 percent per year up through 2025.
- 128 A similar difference appears in the percentage of the labor force with advanced education, including master, doctoral, or professional degrees. In Ventura, Orange, Los Angeles, and San Diego Counties, approximately one-tenth of the labor force holds some form of advanced degree. Riverside, however, is somewhat lower, at just under 6 percent. The same discrepancy appears with college education; approximately one-tenth of Riverside County's total labor force holds a bachelor's degree, while that ratio is approximately one-fifth in all of the other counties examined.²⁸

²⁷ Census 2000, U.S. Census Bureau, Department of Commerce. Includes Riverside County only.

²⁸ Educational attainment data is from 2000 Census and is provided at the County level.

EMPLOYMENT BY SECTOR

VENTURA COUNTY

- 129 As of 2003, the three largest employment sectors in Ventura County included Services (28 percent), Retail (17 percent), and Manufacturing (11 percent). **Table 4** shows Government employment, including Federal, State, and Local governments as well as military employment, totaled almost 16 percent although Federal Government positions have seen decreases of almost 3.5 percent since 1990 and military employment has dropped 1.4 percent in the same time frame.
- 130 The Services sector is expected to see the largest gains, increasing by close to 2 percent annually, and by 2025 over one-third of all employment in Ventura County is expected to be Services related. Other large growth sectors include Finance, Insurance, and Real Estate (1.6 percent per year), Wholesale trade (1.4 percent per year), and Retail (1.2 percent per year).

LOS ANGELES COUNTY

- 131 The Services sector strongly dominates employment in Los Angeles County, employing over 2.1 million people (39 percent of the 2003 labor force). **Table 5** shows the next closest sector is Retail at 14 percent, followed by Manufacturing at 12 percent. Los Angeles County has seen significant job losses since 1990, which has kept its overall annual rate of employment growth for the last 14 years at less than half a percent. Federal Military and Civilian Government, Farm Employment, Manufacturing, and Mining have all seen jobs losses of 2 percent or more, with Federal Military losses being the greatest in terms of percentage (-5.7 percent per year), and Manufacturing in terms of total jobs lost (over 18,000). The only job sector which has seen growth over 2 percent since 1990 is Agricultural Services, creating just under 1,000 jobs.
- 132 Future job growth for Los Angeles County is not expected to be much stronger than past growth, with a projected annual growth rate of just 0.8 percent. Job losses are projected in Manufacturing, Farm Employment, and Federal Civilian Government. While other sectors show positive growth rates, only Services (1.3 percent annually through 2025) posts numbers over 1 percent per year, with State and Local Government coming in second at 0.9 percent per year.

ORANGE COUNTY

- 133 As shown in **Table 6**, Retail plays a large part in Orange County's employment, responsible for 15 percent of total jobs in 2003. Services, while lower than the San Diego and Los Angeles regions, still held over one-third of all jobs. Manufacturing, the third largest employment sector, held 248,000 jobs, or 13 percent overall. Unlike other regions examined, government

Table 4

U.S. Fish & Wildlife Service
 Draft Economic Analysis for Critical Habitat Designation for the RFS
 Past and Projected Employment by Sector - Ventura PMSA [1]

Ventura PMSA

Sector	Historical				Current		Projected				Avg. Yearly Change		Avg. Ann. Growth Rate	
	1990		2000		2003		2015		2025		1990 to 2003	2004 to 2025	1990 to 2003	2004 to 2025
	Jobs	% of Total	Jobs	% of Total	Jobs	% of Total	Jobs	% of Total	Jobs	% of Total				
Industrial Sectors														
Mining	3,100	0.9%	1,400	0.3%	1,500	0.4%	1,600	0.3%	1,700	0.3%	(123)	9	-5.4%	0.6%
Manufacturing	34,900	10.6%	43,600	10.8%	46,500	10.9%	55,500	10.9%	57,900	10.3%	892	518	2.2%	1.0%
Transp. Comm. & Pub. Util.	13,300	4.0%	13,800	3.4%	14,400	3.4%	16,800	3.3%	18,200	3.2%	85	173	0.6%	1.1%
Wholesale Trade	13,300	4.0%	15,600	3.9%	16,900	4.0%	20,600	4.0%	22,900	4.1%	277	273	1.9%	1.4%
Subtotal Industrial Sectors	64,600	19.6%	74,400	18.5%	79,300	18.6%	94,500	18.6%	100,700	17.9%	1,131	973	1.6%	1.1%
Other Sectors														
Farm Employment	10,500	3.2%	15,400	3.8%	16,200	3.8%	17,900	3.5%	18,200	3.2%	438	91	3.4%	0.5%
Agricultural Services, Other	10,200	3.1%	13,400	3.3%	13,700	3.2%	15,000	2.9%	16,700	3.0%	269	136	2.3%	0.9%
Construction	22,500	6.8%	23,100	5.7%	23,600	5.5%	26,700	5.2%	29,500	5.2%	85	268	0.4%	1.0%
Retail Trade	54,800	16.6%	64,700	16.1%	68,700	16.1%	80,400	15.8%	88,600	15.7%	1,069	905	1.8%	1.2%
Fin., Insur., and Real Est.	24,000	7.3%	35,900	8.9%	38,300	9.0%	47,700	9.4%	53,800	9.6%	1,100	705	3.7%	1.6%
Services	91,500	27.8%	126,200	31.4%	134,300	31.5%	168,000	33.0%	194,800	34.6%	3,292	2,750	3.0%	1.7%
Federal Civilian Government	12,400	3.8%	8,100	2.0%	7,900	1.9%	7,300	1.4%	6,600	1.2%	(346)	(59)	-3.4%	-0.8%
Federal Military Government	8,800	2.7%	7,300	1.8%	7,300	1.7%	7,600	1.5%	7,700	1.4%	(115)	18	-1.4%	0.2%
State and Local Government	30,400	9.2%	34,000	8.4%	36,900	8.7%	43,600	8.6%	46,200	8.2%	500	423	1.5%	1.0%
Subtotal Other Sectors	265,100	80.4%	328,100	81.5%	346,900	81.4%	414,200	81.4%	462,100	82.1%	6,292	5,236	2.1%	1.3%
TOTAL	329,700	100.0%	402,500	100.0%	426,200	100.0%	508,700	100.0%	562,800	100.0%	7,423	6,209	2.0%	1.3%

"ventura_emp"

Source: Woods and Poole, 2003

[1] Includes Ventura County.

Table 5

U.S. Fish & Wildlife Service

Draft Economic Analysis for Critical Habitat Designation for the RFS

Past and Projected Employment by Sector - Los Angeles PMSA [1]

Los Angeles PMSA

Sector	Historical				Current		Projected				Avg. Yearly Change		Avg. Ann. Growth Rate	
	1990		2000		2003		2015		2025		1990 to 2003	2004 to 2025	1990 to 2003	2004 to 2025
	Jobs	% of Total	Jobs	% of Total	Jobs	% of Total	Jobs	% of Total	Jobs	% of Total				
Industrial Sectors														
Mining	13,600	0.3%	8,400	0.2%	8,700	0.2%	9,400	0.2%	10,100	0.2%	(377)	64	-3.4%	0.7%
Manufacturing	885,400	16.5%	661,800	12.0%	649,000	11.5%	611,400	10.0%	593,700	8.9%	(18,185)	(2,514)	-2.4%	-0.4%
Transp. Comm. & Pub. Util.	249,100	4.7%	295,600	5.4%	295,500	5.3%	315,300	5.1%	339,500	5.1%	3,569	2,000	1.3%	0.6%
Wholesale Trade	339,200	6.3%	315,400	5.7%	321,400	5.7%	332,600	5.4%	346,800	5.2%	(1,369)	1,155	-0.4%	0.3%
Subtotal Industrial Sectors	1,487,300	27.8%	1,281,200	23.2%	1,274,600	22.7%	1,268,700	20.7%	1,290,100	19.4%	(16,362)	705	-1.2%	0.1%
Other Sectors														
Farm Employment	11,100	0.2%	8,100	0.1%	8,000	0.1%	7,400	0.1%	7,100	0.1%	(238)	(41)	-2.5%	-0.5%
Agricultural Services, Other	29,900	0.6%	42,100	0.8%	42,200	0.8%	43,900	0.7%	48,000	0.7%	946	264	2.7%	0.6%
Construction	208,900	3.9%	212,000	3.8%	207,900	3.7%	218,800	3.6%	234,600	3.5%	(77)	1,214	0.0%	0.6%
Retail Trade	785,500	14.7%	787,700	14.3%	808,400	14.4%	870,500	14.2%	919,200	13.8%	1,762	5,036	0.2%	0.6%
Fin., Insur., and Real Est.	477,800	8.9%	484,100	8.8%	486,000	8.6%	514,400	8.4%	555,500	8.3%	631	3,159	0.1%	0.6%
Services	1,781,100	33.3%	2,089,500	37.9%	2,174,600	38.7%	2,535,600	41.3%	2,863,100	43.0%	30,269	31,295	1.5%	1.3%
Federal Civilian Government	73,600	1.4%	57,400	1.0%	56,900	1.0%	56,000	0.9%	55,900	0.8%	(1,285)	(45)	-2.0%	-0.1%
Federal Military Government	44,300	0.8%	20,600	0.4%	20,700	0.4%	21,500	0.4%	21,800	0.3%	(1,815)	50	-5.7%	0.2%
State and Local Government	455,800	8.5%	530,000	9.6%	544,400	9.7%	602,000	9.8%	663,400	10.0%	6,815	5,409	1.4%	0.9%
Subtotal Other Sectors	3,868,000	72.2%	4,231,500	76.8%	4,349,100	77.3%	4,870,100	79.3%	5,368,600	80.6%	37,008	46,341	0.9%	1.0%
TOTAL	5,355,300	100.0%	5,512,700	100.0%	5,623,700	100.0%	6,138,800	100.0%	6,658,700	100.0%	20,646	47,045	0.4%	0.8%

Source: Woods and Poole, 2003

[1] Includes both Los Angeles County.

"LA_emp"

Table 6
U.S. Fish & Wildlife Service
Draft Economic Analysis for Critical Habitat Designation for the RFS
Past and Projected Employment by Sector - Orange PMSA [1]

Orange PMSA

Sector	Historical				Current		Projected				Avg. Yearly Change		Avg. Ann. Growth Rate	
	1990		2000		2003		2015		2025		1990 to 2003	2004 to 2025	1990 to 2003	2004 to 2025
	Jobs	% of Total	Jobs	% of Total	Jobs	% of Total	Jobs	% of Total	Jobs	% of Total				
Industrial Sectors														
Mining	3,200	0.2%	2,500	0.1%	2,600	0.1%	3,000	0.1%	3,200	0.1%	(46)	27	-1.6%	0.9%
Manufacturing	257,200	16.3%	244,200	13.1%	247,800	12.6%	258,700	11.0%	263,700	9.7%	(723)	723	-0.3%	0.3%
Transp. Comm. & Pub. Util.	44,500	2.8%	63,300	3.4%	67,500	3.4%	86,500	3.7%	99,900	3.7%	1,769	1,473	3.3%	1.8%
Wholesale Trade	94,600	6.0%	117,700	6.3%	134,700	6.9%	193,200	8.2%	241,800	8.9%	3,085	4,868	2.8%	2.7%
Subtotal Industrial Sectors	399,500	25.3%	427,700	22.9%	452,600	23.1%	541,400	23.0%	608,600	22.5%	4,085	7,091	1.0%	1.4%
Other Sectors														
Farm Employment	4,800	0.3%	7,500	0.4%	7,800	0.4%	8,200	0.3%	8,200	0.3%	231	18	3.8%	0.2%
Agricultural Services, Other	21,500	1.4%	27,900	1.5%	29,100	1.5%	33,800	1.4%	38,200	1.4%	585	414	2.4%	1.2%
Construction	90,700	5.7%	105,800	5.7%	107,100	5.5%	121,400	5.2%	134,000	4.9%	1,262	1,223	1.3%	1.0%
Retail Trade	265,500	16.8%	292,400	15.6%	303,500	15.5%	342,000	14.6%	375,000	13.8%	2,923	3,250	1.0%	1.0%
Fin., Insur., and Real Est.	169,100	10.7%	213,600	11.4%	228,600	11.7%	291,500	12.4%	338,000	12.5%	4,577	4,973	2.3%	1.8%
Services	485,900	30.8%	638,200	34.1%	669,900	34.2%	829,700	35.3%	1,006,100	37.2%	14,154	15,282	2.5%	1.9%
Federal Civilian Government	17,100	1.1%	12,900	0.7%	12,900	0.7%	13,700	0.6%	14,100	0.5%	(323)	55	-2.1%	0.4%
Federal Military Government	19,900	1.3%	6,000	0.3%	6,100	0.3%	6,300	0.3%	6,400	0.2%	(1,062)	14	-8.7%	0.2%
State and Local Government	106,000	6.7%	139,000	7.4%	142,000	7.2%	161,100	6.9%	179,300	6.6%	2,769	1,695	2.3%	1.1%
Subtotal Other Sectors	1,180,500	74.7%	1,443,300	77.1%	1,507,000	76.9%	1,807,700	77.0%	2,099,300	77.5%	25,115	26,923	1.9%	1.5%
TOTAL	1,580,000	100.0%	1,871,000	100.0%	1,959,600	100.0%	2,349,100	100.0%	2,707,900	100.0%	29,200	34,014	1.7%	1.5%

"SD_emp"

Source: Woods and Poole, 2003

[1] Includes Orange County.

employment was responsible for less than 10 percent of all employment. It has also seen the highest decreases in Orange County of all P/MSAs examined in this analysis. Over 1,000 Federal Military jobs have been lost since 1990, a decrease of over 8 percent per year. Federal Civilian, Manufacturing, and Mining have also seen negative job growth in the last 14 years, though not to the same degree as Military employment.

- 134 The largest projected growth sector for Orange County in the next 20 years is Wholesale Trade, with an expected growth of more than 2.7 percent per year, followed by Transportation, Communications, and Public Utilities at almost 2 percent per year. Though not as high as other P/MSAs, Orange County still expects significant growth in the Services industry, creating over 15,000 new jobs by 2025. No sectors are expected to experience negative job growth in the next 20 years.

RIVERSIDE-SAN BERNARDINO PMSA

- 135 Similar to Ventura County, Services are responsible for the largest portion of employment, at 30 percent in 2003, followed by Retail Trade at 18 percent and State and Local Government at 12 percent. As shown in **Table 7**, the Riverside-San Bernardino PMSA has also seen significant losses in government employment, losing a total of almost 1,000 jobs in Federal Military and Civilian employment since 1990. State and Local Governments, however, have increased at almost 3 percent per year, and are expected to continue to grow at 2 percent per year through 2025. Like the Ventura PMSA, the Riverside-San Bernardino MSA has seen an overall decrease in employment in the Mining sector in the last 14 years, bringing the total number of jobs to just 1,800 in 2003.
- 136 The largest future job gains are expected in Wholesale trade, with the number of jobs increasing from 64,000 to over 110,000 by 2025, a growth rate of 2.5 percent. Both Services and Retail are expected to grow at 2.1 percent per year, and together will make up an estimated 50 percent of employment in 2025.

SAN DIEGO COUNTY

- 137 Like Los Angeles County, the Services and Retail sectors dominate employment in San Diego County, with a combined 50 percent of total employment. Since 1990, the County has seen annual job losses in Mining (-2.4 percent), Federal Military (-2.0 percent) and Federal Civilian (-1.4 percent) employment, but strong growth in other sectors have kept the overall job growth rate at almost 2 percent per year. **Table 8** shows the Services sector alone has grown at 3.5 percent per year since 1990, and is expected to continue to grow at 2.3 percent for the next 20 years, employing over 40 percent of the workforce by 2025. Strong growth is also projected

Table 7

U.S. Fish & Wildlife Service
 Draft Economic Analysis for Critical Habitat Designation for the RFS
 Past and Projected Employment by Sector - Riverside PMSA [1]

Riverside PMSA

Sector	Historical				Current		Projected				Avg. Yearly Change		Avg. Ann. Growth Rate	
	1990		2000		2003		2015		2025		1990 to 2003	2004 to 2025	1990 to 2003	2004 to 2025
	Jobs	% of Total	Jobs	% of Total	Jobs	% of Total	Jobs	% of Total	Jobs	% of Total				
Industrial Sectors														
Mining	2,300	0.2%	1,800	0.1%	1,800	0.1%	2,100	0.1%	2,200	0.1%	(38)	18	-1.9%	0.9%
Manufacturing	92,300	9.1%	132,900	9.6%	139,000	9.5%	164,000	8.9%	185,000	8.4%	3,592	2,091	3.2%	1.3%
Transp. Comm. & Pub. Util.	43,500	4.3%	64,500	4.7%	68,000	4.6%	83,700	4.5%	92,700	4.2%	1,885	1,123	3.5%	1.4%
Wholesale Trade	37,900	3.7%	56,400	4.1%	64,400	4.4%	90,600	4.9%	110,500	5.0%	2,038	2,095	4.2%	2.5%
Subtotal Industrial Sectors	176,000	17.4%	255,600	18.5%	273,200	18.7%	340,400	18.5%	390,400	17.7%	7,477	5,327	3.4%	1.6%
Other Sectors														
Farm Employment	15,900	1.6%	19,500	1.4%	20,000	1.4%	21,200	1.2%	21,200	1.0%	315	55	1.8%	0.3%
Agricultural Services, Other	23,600	2.3%	29,600	2.1%	30,900	2.1%	36,300	2.0%	41,100	1.9%	562	464	2.1%	1.3%
Construction	88,900	8.8%	109,700	8.0%	116,500	8.0%	150,900	8.2%	177,400	8.1%	2,123	2,768	2.1%	1.9%
Retail Trade	185,400	18.3%	250,900	18.2%	269,100	18.4%	345,900	18.8%	423,800	19.3%	6,438	7,032	2.9%	2.1%
Fin., Insur., and Real Est.	67,100	6.6%	96,000	7.0%	101,300	6.9%	121,800	6.6%	134,400	6.1%	2,631	1,505	3.2%	1.3%
Services	277,600	27.4%	410,300	29.7%	433,900	29.7%	553,600	30.1%	688,300	31.3%	12,023	11,564	3.5%	2.1%
Federal Civilian Government	20,600	2.0%	17,900	1.3%	19,000	1.3%	22,100	1.2%	23,500	1.1%	(123)	205	-0.6%	1.0%
Federal Military Government	32,900	3.3%	21,600	1.6%	21,800	1.5%	22,600	1.2%	22,800	1.0%	(854)	45	-3.1%	0.2%
State and Local Government	123,600	12.2%	168,700	12.2%	177,400	12.1%	225,900	12.3%	277,100	12.6%	4,138	4,532	2.8%	2.0%
Subtotal Other Sectors	835,600	82.6%	1,124,200	81.5%	1,189,900	81.3%	1,500,300	81.5%	1,809,600	82.3%	27,254	28,168	2.8%	1.9%
TOTAL	1,011,600	100.0%	1,379,800	100.0%	1,463,100	100.0%	1,840,700	100.0%	2,200,000	100.0%	34,731	33,495	2.9%	1.9%

*riverside_emp"

Source: Woods and Poole, 2003

[1] Includes both Riverside and San Bernadino counties.

in Finance, Insurance, and Real Estate (2.3 percent annual) and Transportation, Communication, and Public Utilities (1.7 percent annual).

ALL FIVE COUNTIES

138 While each P/MSA examined has different growth rates and employment for all sectors, a variety of trends can be seen. For all P/MSAs included in this analysis, the Services sector is the largest employer, a trend which is expected to continue through 2025. Retail, another significant source of employment, is also expected to see strong growth in most areas. The construction sector is expected to see moderate growth in all the P/MSAs examined, ranging from 0.6 percent per year in the Los Angeles PMSA to 1.9 percent per year in the Riverside PMSA.²⁹ Federal employment, however, at both the civilian and military levels, has experienced significant decreases in all regions, ranging from -0.6 percent to -8.3 percent. Mining, though not a significant source of employment for any MSA examined, has also had negative job growth for all MSAs since 1990.

²⁹ Employers within the construction industry include those engaged in building new structures/roads, additions, repairs, and reconstruction. It also includes general contractors in both residential and non-residential structures, heavy construction (tunnels, bridges, etc), and special trade contracting (masonry, plumbing, etc.). It does not include establishments that build construction materials, or that manage construction.

Table 8

U.S. Fish & Wildlife Service

Draft Economic Analysis for Critical Habitat Designation for the RFS

Past and Projected Employment by Sector - San Diego MSA [1]

San Diego MSA

Sector	Historical				Current		Projected				Avg. Yearly Change		Avg. Ann. Growth Rate	
	1990		2000		2003		2015		2025		1990 to 2003	2004 to 2025	1990 to 2003	2004 to 2025
	Jobs	% of Total	Jobs	% of Total	Jobs	% of Total	Jobs	% of Total	Jobs	% of Total				
Industrial Sectors														
Mining	2,200	0.2%	1,700	0.1%	1,600	0.1%	1,700	0.1%	1,800	0.1%	(46)	9	-2.4%	0.5%
Manufacturing	140,200	9.7%	140,300	8.1%	140,800	7.7%	143,900	6.6%	147,000	5.8%	46	282	0.0%	0.2%
Transp. Comm. & Pub. Util.	43,600	3.0%	60,700	3.5%	64,400	3.5%	80,400	3.7%	93,700	3.7%	1,600	1,332	3.0%	1.7%
Wholesale Trade	51,500	3.6%	61,200	3.5%	65,600	3.6%	81,200	3.7%	93,300	3.7%	1,085	1,259	1.9%	1.6%
Subtotal Industrial Sectors	237,500	16.5%	263,900	15.2%	272,400	15.0%	307,200	14.0%	335,800	13.3%	2,685	2,882	1.1%	1.0%
Other Sectors														
Farm Employment	13,800	1.0%	16,300	0.9%	16,500	0.9%	17,300	0.8%	18,000	0.7%	208	68	1.4%	0.4%
Agricultural Services, Other	17,900	1.2%	25,100	1.4%	27,200	1.5%	32,000	1.5%	35,900	1.4%	715	395	3.3%	1.3%
Construction	81,400	5.7%	97,300	5.6%	99,700	5.5%	111,900	5.1%	122,000	4.8%	1,408	1,014	1.6%	0.9%
Retail Trade	229,000	15.9%	268,300	15.5%	275,200	15.1%	313,700	14.3%	347,700	13.8%	3,554	3,295	1.4%	1.1%
Fin., Insur., and Real Est.	117,600	8.2%	154,200	8.9%	160,200	8.8%	184,300	8.4%	205,200	8.1%	3,277	2,045	2.4%	1.1%
Services	415,100	28.9%	597,200	34.4%	649,200	35.7%	869,900	39.7%	1,076,600	42.7%	18,008	19,427	3.5%	2.3%
Federal Civilian Government	47,700	3.3%	41,600	2.4%	39,900	2.2%	40,200	1.8%	40,700	1.6%	(600)	36	-1.4%	0.1%
Federal Military Government	143,500	10.0%	108,900	6.3%	109,800	6.0%	114,100	5.2%	115,200	4.6%	(2,592)	245	-2.0%	0.2%
State and Local Government	134,500	9.4%	161,100	9.3%	169,600	9.3%	200,700	9.2%	225,700	8.9%	2,700	2,550	1.8%	1.3%
Subtotal Other Sectors	1,200,500	83.5%	1,470,000	84.8%	1,547,300	85.0%	1,884,100	86.0%	2,187,000	86.7%	26,677	29,077	2.0%	1.6%
TOTAL	1,438,000	100.0%	1,733,900	100.0%	1,819,700	100.0%	2,191,300	100.0%	2,522,800	100.0%	29,362	31,959	1.8%	1.5%

"SD_emp"

Source: Woods and Poole, 2003

[1] Includes San Diego County.

IV. ECONOMIC IMPACT TO REAL ESTATE DEVELOPMENT

- 139 This chapter evaluates how actions taken to protect the RFS and its habitat may affect real estate development activities and markets in RFS essential habitat. Specifically, it focuses on the past and future effects of the Act and any “co-extensive” habitat-based land use regulations on the supply and demand for land used in residential and commercial real estate development in areas proposed or excluded from critical habitat designation.
- 140 An overview of our general methodology and approach for evaluating the economic impact of RFS protection on private development is provided below, followed by a presentation of the analysis and estimated total economic costs.

ANALYTICAL APPROACH

- 141 Potential modifications to land use projects stemming from RFS protection can affect landowners, consumers, and real estate markets in general. The total economic impact will depend on the scope of RFS-related conservation activities, pre-existing land use and regulatory controls in the region, and the nature of regional land and real estate markets. To accurately account for all of these factors, and to estimate the corresponding economic impacts, this evaluation employs a series of methodological tasks as described below.

1. Determine Overlap between Essential Habitat and Projected Land Development

- 142 The first step in evaluating the effect of RFS protection on private land development is to identify the amount, type and location of land identified as essential habitat by the proposed rulemaking. The effect on private development stems from projects on land in essential habitat that is feasibly developed during the timeframe being considered. To isolate potentially impacted areas, the analysis excludes undevelopable areas such as existing residential and non-residential development, existing public facilities such as school and parks, and other permanent open space from essential habitat. The remainder is the amount of growth between 2005 and 2024, including both public and private land uses, expected to occur on developable acreage within essential habitat boundaries.

2. Identify Impact of RFS-Related Conservation Activities on Development

- 143 The actual effects of RFS-related conservation activities on land value ultimately will depend on the type and level of project modifications for the RFS. An evaluation of regulatory outcomes for development projects under provisions of CEQA, the CWA, regional HCPs, local land use ordinances, and section 7 of the Act is used to ascertain the average effect of RFS-related land use regulation in real estate development. Thus, the second step is to estimate the expected modifications to land development projects in essential habitat. These project modifications could include habitat restoration, land set-aside, and off-site habitat conservation. Requirements associated with pre-existing regulations or land use restrictions, including Federal, state, local,

or regional laws and agreements, that are co-extensive with RFS protection under section 7 have not been excluded.

3. Evaluate Effects on Regional Real Estate Market and Associated Cost Incidence

- 144 The third step is to determine the significance of RFS-related land use project modifications relative to regional real estate demand and supply dynamics, and the resulting regulatory cost incidence. The incidence or burden of the project modification and other compliance costs will ultimately depend on their scope and the nature of the regional real estate markets.
- 145 The economic impacts are likely to extend beyond the regulated landowners and affect the real estate market, real estate consumers, and the regional economy if (1) the amount of land set-aside (i.e., not developed as a result of RFS protection) is high relative to the total developable land in the region and/or (2) other compliance costs are high relative to real estate development value and cover a significant proportion of developable land. In these cases, landowners and developers may pass on the costs to real estate consumers in the form of higher prices.
- 146 Conversely, if project modification costs are low and/or RFS protection only affects a small fraction of the total developable land supply in a region, then the economic effects are likely to be limited to that sub-set of individual landowners and/or projects. In this case, the regulated landowners will not be able to pass on their increased costs to consumers and their development projects will either relocate to other available sites or proceed with a reduced land value.

4. Estimate Economic Impacts

- 147 The fourth step involves taking the data and conclusions from steps one through three and estimating the potential economic costs associated with RFS protection. The approach to economic cost estimation is different depending on the cost incidence. If the project modification requirements do not affect the overall regional real estate market dynamics, cost impacts are borne by the regulated landowners and reduced land values are estimated. The economic costs are estimated based on the loss in land value associated with required on-site set-asides, increased mitigation costs, and other project modifications incurred by individual landowners/developers.
- 148 If, however, the scale and intensity of the proposed designation is sufficient to affect regional real estate dynamics, regulatory requirements will primarily affect consumers through some mix of increased real estate prices and reduced real estate production. Producers or landowners will also be affected, although those with land outside of the designation area could gain from the reduced supply and corresponding price increase. The total economic effect is measured through the change in producer and consumer surplus, a measure of social welfare.³⁰

³⁰ Consumer surplus is the difference between the total value consumers receive from a particular good and the total

ESTIMATE OF AFFECTED ACREAGE

- 149 Following the methodology outlined above, this section estimates the number of acres of projected development in essential habitat likely to be impacted by RFS-related conservation activities. This calculation starts with the total number of acres in essential habitat as a whole and deducts from this the amount of land that is unlikely to be affected by RFS-related conservation measures (i.e., it would not be developed in any case).

POTENTIAL DEVELOPMENT IN ESSENTIAL HABITAT

- 150 Essential habitat contains lands that are both developed and undeveloped. Some of the developed acreage is dedicated to public uses such as schools, roads, or community parks. Other developed acreage is privately owned, such as shopping centers and homes.
- 151 Acreage identified as undeveloped may be preserved for biological or other natural resource values. Of the remaining undeveloped acreage, some land will be developable and zoned for residential or commercial uses. Conditions of supply and demand in these real estate markets, however, may not support the development of all the developable acreage during the timeframe of this analysis. Based on broad trends in subregional population growth, housing markets, and land supply, this analysis will estimate how much of the developable acreage will be proposed and approved for development in the next 20 years.
- 152 In addition, some of the undeveloped acreage, while not permanently protected through ownership or other legal considerations, is considered largely undevelopable because of topographic, hydrologic, or other geophysical constraints. This section will detail for the five counties included in RFS essential habitat the methods and data used to estimate two key land use variables:

amount they pay for that good. When the price of a good goes up, consumer surplus falls (assuming no shift in demand) since a portion of the consumers fall out of the market altogether and the remainder pay a higher price. Producer surplus, alternatively, is the difference between the total market value associated with a particular level of output and the total market costs associated with supplying that level of output.

- The acreage of RFS essential habitat likely to be developed in the next 20 years, and
- The amount of land set aside from development in whole or part to conserve RFS habitat since the listing of the species.

AFFECTED ACREAGE IN SAN DIEGO COUNTY

- 153 SANDAG maintains Geographic Information System (GIS) data describing 2003 land use for all of San Diego County. In addition, SANDAG has produced a data layer combining the General Plan land use designations for all jurisdictions in the County. As shown in **Table 9**, using this data, essential habitat lands can be subdivided into five land use categories:
- Developed private lands
 - Improved or unimproved public lands³¹
 - Undeveloped land preserved in whole or part for the RFS
 - Undeveloped and future undevelopable land in the next 20 years
 - Undeveloped and future developable land in the next 20 years
- 154 Developed private lands include areas placed in SANDAG categories of spaced rural residential, light industry, wholesale trade, industrial parks, store-front commercial, warehouse and public storage, single family residential, landscape open space, and multifamily residential. Improved or unimproved public lands include areas identified by SANDAG as recreational and passive parks, freeways, railroad and road right of ways, communications and utilities, other transportation, general aviation airports, senior high schools, and landfills. Other land use categories are available to SANDAG for its data layer, but the categories listed here are only ones relevant to the Otay Mesa area where RFS essential habitat has been identified.
- 155 No databases are available to determine which preserved lands in RFS essential habitat were preserved in whole or part for the RFS.³² SANDAG, however, maintains HabiTrak, a GIS data layer that inventories land conserved or developed in the MHPA (preserve area) of the MSCP in southern San Diego County. HabiTrak data supplements the General Plan and land use data used in the analysis by provided additional information on preserved lands.
- 156 For the purposes of the analysis, all land identified by these databases as open space reserves/preserves has been categorized in this analysis as undeveloped land but preserved for

³¹ Public lands not preserved in whole or part for the RFS.

³² A comprehensive survey of biological opinion addressing the RFS demonstrates that these documents offer at best an incomplete record total preserved acreage for the RFS.

Table 9
U.S. Fish & Wildlife Service
Draft Economic Analysis for Critical Habitat Designation for the RFS
Current and Future Otay Mesa Region Land Use, RFS Essential Habitat

Land Use	Assumption	Essential Habitat		
		Proposed <i>acres</i>	Excluded <i>acres</i>	Total <i>acres</i>
Summary of 2003 Land Use Data				
Existing Developed Private [1]		0.0	80.3	80.3
Existing Improved or Unimproved Public [2]		52.3	248.4	300.7
Existing Undeveloped but Preserved [3]		222.6	1,400.5	1,623.1
Existing Undeveloped and Future Undevelopable within 20 years [4]		79.5	291.0	370.6
Existing Undeveloped and Future Developable within 20 years [5]		766.4	1,503.9	2,270.2
Total, Otay Mesa Essential Habitat		1,120.9	3,524.1	4,645.0
Detail for Lands Affected Since Listing				
Existing Undeveloped but Preserved [6]	100% RFS-related	222.6	1,400.5	1,623.1
Total Acreage Impacted Since Listing		222.6	1,400.5	1,623.1
Detail for Lands Affected 2005-2024				
Existing Undeveloped and Future Developable within 20 years [5]		766.4	1,503.9	2,270.2
Potential Set Aside as Avoided Habitat [7]				
low estimate	5% of private uses	38.3	75.2	113.5
high estimate	30% of private uses	229.9	451.2	681.1
Total Acreage Impacted 2005-2024				
low estimate		38.3	75.2	113.5
high estimate		229.9	451.2	681.1

Source: SANDAG COMP2003 GIS layer, HabiTrak GIS layer, and USFWS

"otay master"

- [1] Private uses include residential, commercial, industrial, and other type of land uses.
- [2] Such as utilities, schools, and transportation facilities. Assumes that, because of open space requirements in most public projects, no project modifications for public projects have occurred. Excludes public lands preserved in whole or part for the RFS since its listing (see also Note 3).
- [3] All existing preserved lands, whether public or private, are assumed to have been preserved in whole or part for the RFS since its listing. Public comment is solicited to establish any evidence that land was preserved in RFS critical habitat solely for other species, in which case the acreage will be excluded if the preservation occurred prior to RFS listing. Excludes areas preserved according Service biological opinions when the RFS is not referenced in the document.
- [4] "Undevelopable" includes those lands not designated in a General or Specific Plan for any type of residential, commercial, or industrial development.
- [5] Land having a General or Specific Plan designation for some type of residential, commercial, or industrial development. Includes private land that will be dedicated for in-tract public uses (streets, utilities, and in some cases schools and parks, etc.) once development occurs.
- [6] Estimate of affected acreage will be used to directly calculate the loss of private development value. This method recognizes that preserved acreage may have been protected as a condition of approval for private or public projects located either inside or outside current essential habitat. If the preserved acreage was otherwise developable for private or public uses, the area is assumed to have been impacted by past RFS conservation activities. Private development values may in some cases overstate the impact.
- [7] Assumes that RFS-related regulation will require between 5% and 30% of the gross acreage to be undeveloped and left in its natural state. No long-term monitoring or management costs are assumed.

the RFS. While such an assumption will overstate past conservation costs imposed on landowners in developable areas of essential habitat, this approach will avoid an underestimate of the costs of RFS-related conservation activities since the species' listing.

- 157 The final two categories of undeveloped land pertain to SANDAG's vacant land, field crops, and intensive agriculture land use categories. The total acreage in these categories comprises land that is potentially developable although not necessarily planned for development. To determine what portion of undeveloped lands is developable, a second SANDAG data layer containing land use designations from local General Plans was placed over the land use data layer.
- 158 Where private land uses are planned for this undeveloped acreage, such as spaced rural residential, single family residential, multifamily, light industry, community shopping centers, neighborhood shopping centers, other retail and trade, and low rise office, the acreage is assumed to be developable in the next 20 years. It is possible that less than 100 percent of developable acreage in Otay Mesa will be developed by 2025.
- 159 However, given the significant development activity in the more urbanized western and northern portions of essential habitat and the status of the East Otay Mesa Specific Plan process underway with the County of San Diego, the assumption that 100 percent of this acreage will be developable is a reasonable upper bound estimate and will not understate impacts of RFS-related conservation activities.
- 160 All other planned land uses, including public uses and open space preserves/reserves, for developable San Diego County essential habitat were assumed to be either undevelopable or developable without significant cost from RFS-related conservation activities. The latter assumption follows from observation that most public projects, including libraries, parks, and schools, show little evidence that the presence of vernal pool habitat changes the design or construction of the public facilities.³³

AFFECTED ACREAGE IN VENTURA, LOS ANGELES, ORANGE, AND RIVERSIDE COUNTIES

- 161 SCAG maintains GIS data describing a blend of 2000 and 2001 land uses for Ventura, Orange, Los Angeles, and Riverside Counties. Similar to SANDAG GIS information, SCAG GIS data allows land to be separated into five basic categories:
- Developed private lands

³³ Public projects with minimal developable acreage changes would include the Sierra Mesa Public Library and the San Ysidro High School in the City of San Diego.

- Improved or unimproved private lands³⁴
- Undeveloped lands but preserved for the RFS
- Undeveloped and future undevelopable land within 20 years
- Undeveloped and future developable land within 20 years

- 162 As shown in **Tables 10 and 11**, developed private lands include any lands categorized by SCAG with residential or commercial use. Examples of such categories include rural residential, low density, high density single family residential, modern strip development, and commercial recreation.
- 163 Improved or unimproved public lands include examples such as freeways and major roads, electrical power facilities, water storage facilities, senior high schools, and airports. Also included in public lands are developed parks and/or open space not listed for commercial recreation.
- 164 Undeveloped land but preserved for the RFS is not specifically listed in the SCAG land use categories. Acreage in this category was provided by information in biological opinions, other legal documents, or personal interviews.
- 165 Undeveloped and future undevelopable land in the next 20 years includes lands preserved for reasons other than the RFS (lands preserved for other species, for instance) and lands with physical constraints that make the land undevelopable (bodies of water, etc).
- 166 Undeveloped and future developable land in the next 20 years includes any lands that have the potential for future development that are not constrained by topographic and geographic or legal constraints. This includes lands currently used for agriculture, viticulture, or horse rearing that could be sold for development in the future. It also includes lands listed by SCAG as Vacant Undifferentiated. As SCAG does not provide a General Plan based zoning layer, all land listed as Vacant Undifferentiated was considered to be developable in the next 20 years. Exceptions were made when biological opinions, legal documents, known zoning regulations, or personal interviews or visits gave further insight into the future use of the land.
- 167 As with SANDAG data, the assumption that all land with unknown future uses will be developable provides for an upper bound estimate of development to occur in the next 20 years.

³⁴ Public lands not preserved in whole or part for the RFS.

Table 10
U.S. Fish & Wildlife Service
Draft Economic Analysis for Critical Habitat Designation for the RFS
Current and Future SCAG Counties Land Use: Land Proposed for Critical Habitat

County/Essential Habitat Subregion	Current Land Uses (acres)						LANDS AFFECTED SINCE LISTING	LANDS AFFECTED 2005-2024		
	Private Developed [1]	Public [2]	Preserved [3]	Undeveloped/ Undevelopable [4]	Undeveloped/ Developable [5]	Total	Undeveloped Land (acres)	Existing Undeveloped but Developable in 20 years (acres)		
							Preserved [6]	Undeveloped/ Developable [5]	Land Set Aside for Habitat [7]	
									low	high
Ventura County										
Carlsberg Ranch/Tierra Rajada [8]	77.1	26.6	1.2	406.6	0.0	511.5	1.2	0.0	0.0	0.0
Los Angeles County										
Cruzan Mesa	7.5	44.2	0.0	0.0	482.1	533.8	0.0	482.1	24.1	144.6
LAX [9]	3.4	65.5	0.0	34.9	0.0	103.8	0.0	0.0	0.0	0.0
Orange County										
El Toro [10]	0.0	1.3	0.0	135.9	0.0	137.1	0.0	0.0	0.0	0.0
Saddleback Meadows [11]	41.3	11.0	2.5	273.4	428.0	756.2	2.5	428.0	21.4	128.4
Tijeras Creek [12]	0.4	20.3	0.0	170.0	139.3	330.0	0.0	139.3	7.0	41.8
Chiquita Ridge	7.1	3.1	0.0	0.0	492.4	502.7	0.0	492.4	24.6	147.7
Radio Tower Rd. [13]	3.4	0.0	0.0	753.2	0.0	756.5	0.0	0.0	0.0	0.0
Riverside County										
March AFB [14]	0.0	145.7	0.0	0.0	0.0	145.7	0.0	0.0	0.0	0.0
Total [15]	140.2	317.7	3.7	1773.8	1541.9	3777.3	3.7	1541.9	77.1	462.6

"scag proposed"

Table 10
U.S. Fish & Wildlife Service
Draft Economic Analysis for Critical Habitat Designation for the RFS
Current and Future SCAG Counties Land Use: Land Proposed for Critical Habitat

- [1] Includes lands developed for private uses, including residential, commercial, and industrial development.
- [2] Such as utilities, schools, water storage facilities, developed parks/recreation, and freeways and roads. Assumes that, because of open space requirements in most public projects, no project modifications for public projects have occurred. Excludes public lands preserved in whole or part for the RFS since its listing (see also Note 3).
- [3] All existing preserved lands, whether public or private, are assumed to have been preserved in whole or part for the RFS since its listing. Public comment is solicited to establish any evidence that land was preserved in RFS essential habitat solely for other species, in which case the acreage will be excluded if the preservation occurred before RFS listing. Excludes areas preserved according to Service biological opinions when the RFS is not referenced in the document.
- [4] Includes lands undevelopable because of physical, zoning, or usage constraints, undeveloped parks, and wildlife preserves for species other than RFS.
- [5] Includes vacant lands not constrained as in Note 4 and agricultural or similar lands which may be used for development in the next 20 years. Includes private land that will be dedicated for in-tract public uses (streets, utilities, and in some cases schools and parks, etc.) once development occurs.
- [6] Estimate of affected acreage will be used to calculate directly the loss of private development value. This method recognizes that preserved acreage may have been protected as a condition of approval for private or public projects located either inside or outside current essential habitat. If the preserved acreage was otherwise developable for private or public uses, the area is assumed to have been impacted by past RFS conservation activities. Private development values may in some cases overstate the impact.
- [7] Assumes that RFS-related regulation will require between 5% and 30% of the gross acreage to be undeveloped and left in its natural state. No long-term monitoring or management costs are assumed.
- [8] Carlsberg Ranch's "Private Developed" acreage includes a Lennar Homes project which covers approximately 74 acres of critical habitat. "Preserved" acreage taken from Biological Opinion and personal interviews and assumes a density of 5 units/acre. Personal interviews with Service staff have indicated that approximately 400 acres of the Carlsberg Ranch area are owned by a private landowner with intent to leave the land undeveloped for possible use as a mitigation site. As such, no development is expected there in the next 20 years.
- [9] Undeveloped/Undevelopable land includes 132 acre wildlife sanctuary on-site not attributable to RFS. Because of proximity to the airport, remaining undeveloped land is assumed to be undevelopable.
- [10] Personal interviews with BRAC staff members have indicated that areas adjacent to the vernal pools subregion are planned for FBI explosives training. As such, no development is expected to occur, and all vacant lands are considered undevelopable.
- [11] The Biological Opinion for the Country Homes Project in Orange County indicated that mitigation likely took place in the Saddleback Meadows subregion and included 2.5 total acres of wetland area. 273 acres of "Vacant Undifferentiated" land in the Saddleback Meadows habitat subregion falls in O'Neil park and therefore is not expected to develop in the next 20 years. Personal interviews with staff at Orange County Harbors, Beaches, and Parks indicate that no lands in O'Neil were protected as a result of RFS, and therefore no past costs are associated with any acreage within the park boundaries.
- [12] 170 acres of "Vacant Undifferentiated" land in the Saddleback Meadows habitat subregion falls in O'Neil park and therefore are not expected to develop in the next 20 years. See footnote 12 for details on cost allocation.
- [13] Maps dated January 2004 indicate that the Radio Tower Road Pools are in areas designated for Open Space, according to the Orange County General Plan. Development is not expected in this area in the next 20 years.
- [14] Interviews with staff of the March Joint Powers Authority have indicated that RFS habitat lies in an area planned for possible widening of flood channels. Associated costs are discussed in the public activities section of this analysis.
- [15] Acreage numbers may vary slightly because of rounding. SANDAG and SCAG land use acreage (minus Riverside) has been adjusted to account for recent changes in total acres of essential habitat.

Table 11
U.S. Fish & Wildlife Service
Draft Economic Analysis for Critical Habitat Designation for the RFS
Current and Future SCAG Counties Land Use: Land Excluded from Designation

							LANDS AFFECTED SINCE LISTING	LANDS AFFECTED 2005-2024		
Current Land Uses (acres)							Undeveloped Land (acres)	Existing Undeveloped but Developable in 20 years (acres)		
County/Essential Habitat Subregion	Private Developed [1]	Public [2]	Preserved [3]	Undeveloped/ Undevelopable [4]	Undeveloped/ Developable [5]	Total	Preserved [6]	Undeveloped/ Developable [5]	Land Set Aside for Habitat [7]	
									low	high
Orange County										
El Toro [8]	0.0	1.9	0.0	13.4	0.0	15.3	0.0	0.0	0.0	0.0
Viejo Conservation Bank [9]	2.7	11.6	2.0	52.6	0.0	68.8	2.0	0.0	0.0	0.0
Riverside County										
Lake Elsinore	5.4	12.1	0.0	8.0	535.2	560.7	0.0	535.2	26.8	160.6
Banning Pool	4.8	0.0	0.0	0.0	217.5	222.3	0.0	217.5	10.9	65.3
Scott Road	5.1	0.0	0.0	0.0	24.6	29.6	0.0	24.6	1.2	7.4
Schleuniger Pool/Clayton Ranch [10]	5.0	2.5	197.5	0.0	0.0	205.0	197.5	0.0	0.0	0.0
Skunk Hollow/Johnson Ranch [11]	9.6	3.6	374.6	0.0	0.0	387.8	374.6	0.0	0.0	0.0
Santa Rosa Plateau [12]	4.5	1.3	0.0	3225.5	1162.9	4394.2	0.0	1162.9	58.1	348.9
Total [13]	37.0	31.0	574.2	3286.1	1940.2	5868.5	574.2	1940.2	97.0	582.1

"scag excluded"

Table 11
U.S. Fish & Wildlife Service
Draft Economic Analysis for Critical Habitat Designation for the RFS
Current and Future SCAG Counties Land Use: Land Excluded from Designation

- [1] Includes lands developed for private uses, including residential, commercial, and industrial development.
- [2] Such as utilities, schools, water storage facilities, developed parks/recreation, and freeways and roads. Assumes that, because of open space requirements in most public projects, no project modifications for public projects have occurred. Excludes public lands preserved in whole or part for the RFS since its listing (see also Note 3).
- [3] All existing preserved lands are assumed to have been preserved in whole or part for the RFS since its listing, whether public or private. Public comment is solicited to establish any evidence that land was preserved in RFS essential habitat solely for other species, in which case the acreage will be excluded if the preservation occurred before RFS listing. Excludes areas preserved according Service biological opinions when the RFS is not referenced in the document.
- [4] Includes lands undevelopable because of physical, zoning, or usage constraints; undeveloped parks; and wildlife preserves for species other than RFS.
- [5] Includes vacant lands not constrained as in Note 4 and agricultural or similar lands which may be used for development in the next 20 years. Includes private land that will be dedicated for in-tract public uses (streets, utilities, and in some cases schools and parks, etc.) once development occurs.
- [6] Estimate of affected acreage will be used to directly calculate the loss of private development value. This method recognizes that preserved acreage may have been protected as a condition of approval for private or public projects located either inside or outside current essential habitat. If the preserved acreage was otherwise developable for private or public uses, the area is assumed to have been impacted by past RFS conservation activities. Private development values may in some cases overstate the impact.
- [7] Assumes that RFS-related regulation will require between 5% and 30% of the gross acreage to be undeveloped and left in its natural state. No long-term monitoring or management costs are assumed.
- [8] Personal interviews with BRAC staff members have indicated that areas adjacent to the vernal pools subregion are planned for FBI explosives training. As such, no development is expected to occur, and all vacant lands are considered undevelopable.
- [9] Interviews with Service staff have indicated that the Viejo Conservation bank was established largely for the protection of the California Gnatcatcher and that only 2 acres of land can be attributed to RFS habitat protection.
- [10] Multiple Biological Opinions list both Schleuniger Pool and Clayton Ranch as conservation areas. All undeveloped land in these subregions is assumed to be preserved for the RFS.
- [11] Interviews with members for the Center for Natural Lands Management and a site visit indicated that essential habitat at Skunk Hollow and Johnson Ranch is not expected to see any private development within the next 20 years.
- [12] Personal interviews indicated that some land in the Santa Rosa Plateau was purchased by the Metropolitan Water District as off-site mitigation for the Diamond Lake Reservoir project in Riverside County. While exact acreage purchased and set aside for the RFS is unknown, cost information was available, and costs are included in Table 18.
- [13] Acreage numbers may vary slightly because of rounding. SANDAG and SCAG land use acreage (minus Riverside) has been adjusted to account for recent changes in total acres of essential habitat.

RFS LAND DEVELOPMENT ASSUMPTIONS

- 168 With few exceptions, the land that is set aside for conservation in the next 20 years is assumed to be located on the development site. Although compensation options for fill of vernal pools by land development activity is recognized by most regulatory processes, including local land use ordinances in San Diego County, 404(b) permitting by the USACE, and historical section 7 consultations conducted by the Service, few compensation sites exist and the likelihood of increasing the availability of compensation sites using created pools is small.
- 169 As discussed in **Chapter II**, vernal pool geography, especially in Southern California, is highly heterogeneous, and no single rule of thumb can generally describe the amount of land that is required for RFS-related conservation activities. For this reason, this analysis constructed a sensitivity test to a range of set aside requirements. On the low end, it is assumed that at least 5 percent of developable acreage in essential habitat would be set aside as a condition of approval for development of the rest of the site. On the high end, the requirement is set at 30 percent of developable acreage.³⁵ **Tables 9 through 11** calculate the range of land area by habitat subregion that RFS-related conservation could remove from development over the next 20 years.
- 170 This method for estimating past project modifications required by RFS-related conservation activities recognizes that the amount of acreage protected in certain habitat subregions may be the result of development elsewhere. That is, the preserve acreage total is far in excess of what would be reasonably expected from Federal, state, and local land use regulation of remaining RFS habitat. At least in part, this analysis assumes that the preserved acreage may have been purchased as a condition of development in another area of the county or region. Documentation is rarely available to link preserved acreage with either the RFS or with a development site. Hence, this method will be more likely to overstate than to understate the impacts from past conservation.

ECONOMIC IMPACT OF PROPOSED RULEMAKING

- 171 This section uses the land development projections and assumptions described above to estimate (1) the regional effect of set-aside land on real estate markets and prices, and (2) the present value of future (2005–2024) development forgone because of RFS protection. This section also evaluates the economic cost imposed on land development projects associated with RFS protection since the listing of the species. The economic cost associated with foregone

³⁵ A review of all biological opinions written as a part of section 7 regulation of homebuilding since the listing of the RFS provided no strong pattern of set-aside percentages. Only two projects provided information on both the project size and the gross area preserved for the RFS. A Riverside County project preserved approximately 32 percent of the project site, while a Ventura County project set aside approximately 3 percent of the project site.

development (i.e., loss in land value) is summarized in **Table 12**, with more detailed descriptions and summaries provided below.

REGIONAL REAL ESTATE EFFECTS

- 172 For real estate development, the incidence or burden of RFS-related conservation activities is determined by the nature of regional real estate markets. The economic impacts are likely to extend beyond individually regulated landowners and affect the real estate market as a whole, including consumers of real estate products (e.g., homes and commercial buildings) if the following circumstances exist:
- The acreage of preservation required in RFS essential habitat are high relative to the developable land in the region, and/or
 - The total costs of preserving habitat in compliance with Federal, state, and local laws are high relative to real estate development value and cover a significant proportion of developable land.
- 173 Conversely, if preservation costs are low or conservation activities only affect a small fraction of the total developable land supply in a region, then the economic effects are likely to be limited to the individual landowners or projects in RFS essential habitat. These landowners will not be able to pass on their increased costs to consumers and their development projects will either relocate to other available sites or proceed at a reduced value. Thus, for each major category of economic impact, the analysis determines the significance of the land use constraints relative to local real estate demand and supply dynamics.
- 174 To screen for significant market impacts from RFS-related conservation activities, including whether the supply of housing may be reduced, the analysis compares the maximum number of housing units that were displaced from land preserved for the RFS to total housing production on a county level.³⁶ Given a wide variety of new home residential densities in essential habitat subregions, a median value of 5 homes per gross developable acre was selected.
- 175 In addition, historical land use data suggests that 53 percent of all developed acreage in San Diego County is allocated to residential development, and the percentage rises to 65 percent if calculated based on the amount of private developed uses only.³⁷ These assumptions allow a translation from preserved acres to displaced homes. Total housing production since the listing of the species is obtained from historical building permit data, and an average annual output

³⁶ The use of residential-only real estate data assumes that residential impacts are an adequate surrogate for impacts on nonresidential land uses.

³⁷ SANDAG, 1997, "INFO—Land Use in the San Diego Region," accessed at <http://www.sandag.org>.

Table 12
U.S. Fish & Wildlife Service
Draft Economic Analysis for Critical Habitat Designation for the RFS
Real Estate Development Impacts for All Lands [1]

Essential Habitat Category	Impacts Since Listing	Impacts 2005-2024		Total Impacts	
		Low	High	Low	High
Land Proposed for Designation	\$41,618,000	\$36,275,000	\$204,058,000	\$77,893,000	\$245,676,000
Land Excluded from Designation	\$357,902,000	\$27,058,000	\$156,952,000	\$384,960,000	\$514,854,000
Total, All Essential Habitat	\$399,520,000	\$63,333,000	\$361,010,000	\$462,853,000	\$760,530,000

"real estate sum"

Sources: CIRB, Dataquick, USFWS, and EPS Personal Interviews

[1] Includes costs because of regulatory delay but not the costs of additional CEQA review. CEQA impacts are shown in **Tables ES-1 and ES-2.**

level is used to project housing output over the next 20 years. Housing output information is summarized in **Tables 13** and **14**.

- 176 The screening test calculates the percentage of total housing production represented by the housing units not built because of RFS preservation of habitat. If a significant amount of housing output is affected the RFS-related conservation activities, then additional analysis of changes to consumer or producer surplus or the estimation of regional economic effects may be required.

Housing Market Effects, 2005-2024

- 177 To screen for potential shifts in the equilibrium quantity and price of housing in the next 20 years in each county, the analysis estimates the reduction in new homes built based on the total acres of habitat set-aside on developable lands between 2005 and 2024. These reductions are compared to the total amount of housing estimated for areas proposed for or excluded from designation. **Table 14** shows that, given RFS-related conservation activities, four counties (all but Ventura) produced fewer housing units. The displacement of housing units represents between 0.45 to 1.25 percent of each county's 20-year probable housing output. The small percentage of the total new housing supply impacted in each of the four counties does not suggest that consumers will pay a higher price for new or existing housing in the next 20 years.

Housing Market Effects Since RFS Listing

- 178 To screen for potential shifts in the equilibrium quantity and price of housing since listing in each county, the analysis estimates the reduction in new homes built based on the total habitat set-aside on developable lands since the listing of the species. These reductions are compared to the total amount of housing estimated to have been built in areas proposed for or excluded from designation. **Table 14** shows that, given RFS-related conservation activities, San Diego County may have produced 3,700 fewer housing units in areas excluded from the designation, or 4.4 percent of the total built, over the 12-year time period. The share of housing output in the other counties that may have been displaced by RFS-related conservation activities is 1.11 percent or below.
- 179 The level of supply reductions in San Diego County suggest that the real estate market and housing prices may have been affected. In this instance, additional consumers and producers are affected by the changes in price and quantity, and the magnitude of the total impacts in this instance would surpass the landowner-only total impact estimated in this analysis.

Other Considerations

- 180 It is important to note that the estimates summarized in **Table 14** represent an overestimate of the RFS protection efforts on regional development opportunities. The following factors

Table 13
U.S. Fish & Wildlife Service
Draft Economic Analysis for Critical Habitat Designation for the RFS
Single-Family Building Permits by County 1993-2003, 2005-2024 Projected

Year	County				
	Ventura	LA	Orange	Riverside	San Diego
1993	1,166	4,375	4,507	7,012	4,076
1994	1,649	4,605	7,565	7,690	5,247
1995	1,954	5,400	5,663	6,803	4,736
1996	2,133	5,377	7,074	7,023	5,816
1997	2,071	6,788	8,219	8,678	8,338
1998	2,811	6,887	7,366	10,758	9,160
1999	3,662	7,858	7,686	12,659	9,993
2000	2,995	8,417	6,794	13,630	9,167
2001	3,157	8,181	5,925	16,556	9,326
2002	2,228	8,217	6,423	20,591	9,749
2003	2,267	10,235	5,539	25,256	9,382
Total	26,093	76,340	72,761	136,656	84,990
Avg. Annual	2,372	6,940	6,615	12,423	7,726
Projected Permits (2005-2024) [1]	47,000	139,000	132,000	248,000	155,000

"projected_permits"

Source: CIRB

[1] Assumes that past growth rates will continue in the next 20 years. This is a conservative estimate, and the number of permits could be larger as counties add population.

Table 14
U.S. Fish & Wildlife Service
Draft Economic Analysis for Critical Habitat Designation for the RFS
Screening Test for Housing Market Equilibrium Shift

Item / County	Impacts Since Listing		Impacts 2005-2024 [1]	
	Proposed	Excluded	Proposed	Excluded
<u>Acreage Set Aside (next 20 years)</u>	<i>acres</i>	<i>acres</i>	<i>acres</i>	<i>acres</i>
Ventura	1.2	0.0	0.0	0.0
Los Angeles	0.0	0.0	144.6	0.0
Orange	2.5	2.0	317.9	0.0
Riverside	0.0	572.2	0.0	582.1
San Diego	222.6	1400.5	229.9	451.2
<u>Acreage of Residential Development [2]</u>	<i>acres</i>	<i>acres</i>	<i>acres</i>	<i>acres</i>
Ventura	0.6	0.0	0.0	0.0
Los Angeles	0.0	0.0	93.3	0.0
Orange	1.3	1.1	205.1	0.0
Riverside	0.0	304.6	0.0	375.5
San Diego	118.5	745.7	148.3	291.1
<u>Housing Units Displaced [3]</u>	<i>units</i>	<i>units</i>	<i>units</i>	<i>units</i>
Ventura	3	0	0	0
Los Angeles	0	0	622	0
Orange	7	5	1,368	0
Riverside	0	1,523	0	2,504
San Diego	593	3,728	989	1,941
<u>Percentage of Total Projected Units [4]</u>				
Ventura	0.01%	0.00%	0.00%	0.00%
Los Angeles	0.00%	0.00%	0.45%	0.00%
Orange	0.01%	0.01%	1.04%	0.00%
Riverside	0.00%	1.11%	0.00%	1.01%
San Diego	0.70%	4.39%	0.64%	1.25%

"percent_proj"

Sources: SCAG and SANDAG

[1] Assumes high range (30%) set aside for future development.

[2] "Acreage for Residential Development" assumes that only a portion of developed land will be used for residential development. The percentage varies depending on whether all land (public and private) is considered, or if only land developed for private uses is considered. In the former case, SANDAG data covering new land uses between 1990 and 1995 indicate that approximately 53% of all development will be for residential use. In the latter, the share is approximately 65%. As acreage in the "Impacts Since Listing" category includes both public and private lands, the acreage for residential development is calculated by multiplying the total preserved acreage by 53%. "Impacts 2004-2025," however, includes only private land, and therefore the "Acreage for Residential Development" is found by multiplying the estimated preserved acreage by 65%.

[3] Assumes a housing unit density of 5 units/gross developable acre.

[4] Calculated by dividing the displaced housing units by projected permits (2005-2024) in Table 13.

suggest that the RFS-related on-site habitat set-aside will actually represent a much smaller proportion of the regional real estate market:

1. **Regional land supply is greater than projected demand through 2025.** The above estimate relies on projected land consumption through 2025 as a proxy for long-term supply. In reality, the long-term land supply is greater than demand through 2025 because many of the communities in the five-county area are not expected to reach build-out until significantly beyond that date.
2. **Developers will adjust to reduced land supply by increasing density.** The above estimate assumes that development in areas unaffected by RFS protection cannot occur at higher densities. In practice, densification and revitalization of under-utilized “in-fill” sites can continue to provide significant development opportunities in land constrained markets.

180 Given the factors described above, and the fact that most of the reduction in 2005-2024 housing output was a small percentage of total housing supply for both lands proposed for and excluded from designation, the project modifications associated with RFS protection are not expected to have a significant impact on the dynamics of the future regional real estate market. Some projects may be distributed to other locations, while others may proceed with higher mitigation costs and lower land values, but no overall effect on market real estate prices is anticipated. However, because of habitat-related reduction of housing output on lands excluded from the designation in San Diego County, housing prices in San Diego County since the listing (1993 to the present) may have been affected, and parties outside of regulated landowners may have borne some of the costs associated with RFS protection.

ECONOMIC IMPACT OF LOST LAND DEVELOPMENT OPPORTUNITIES

181 The section calculates the loss in land value for on-site set-aside because of RFS conservation activities in past and future private development projects.

Real Estate Land Value Data and Assumptions

182 Real estate price data for each of the five counties was used to estimate the cost, or lost value, of on-site set-aside acres. Summaries of raw market data and the calculation of the “residual land value” for each habitat subregion are presented in **Appendix C**. Two important assumptions guide the calculation of the residual land value for the timeframes used in this analysis.

183 First, the residual land value is an estimate of the value of a raw, unimproved parcel with no infrastructure that is zoned for the development type in question (e.g., single family residential, office, etc.). The use of unimproved land values is appropriate because a developer seeking project entitlement will not invest money in infrastructure or other improvements on land

designated as a habitat set-aside through the consultation process. Using improved land prices would therefore overestimate the real-estate value lost because of RFS protection.

- 185 This analysis assumes that the value of raw, unimproved land will range from 8 to 15 percent of finished product value, depending on the type of land use in question. In reality, raw land values can vary substantially depending on unique physical and locational factors as well as the market conditions that exist at the time of sale. However, given that reliable raw land sales data is unavailable, this analysis relies on a residual land value estimate based on the observed market values for finished products (e.g., new home sales).
- 186 A residual land value calculation for a typical single-family residential product is provided in **Table 15**. The assumed home price of \$427,000 represents an average for single-family units in the five counties included in this analysis. As shown, the residual land value for a typical residential product represents approximately 13 percent of the finished product price.
- 187 Second, this analysis assumes that raw land values will experience real appreciation through time, reflecting the relatively strong performance of California's real estate markets over the last ten to 20 years. Specifically, raw land values are assumed to appreciate at a rate of 4.25 percent per year in real terms (e.g., adjusted for inflation) over the next 20 years, or through 2024. This rate reflects an average of a 10-year and a 20-year trend in repeat sales or refinancing of the same residential properties in California, a method that controls for changes in housing quality, location, and size. Based on this indexing method, the real value of housing grew at 2.0 percent per year between 1980 and 2003 and at 6.5 percent between 1994 and 2003. The average of these rates, or 4.25 percent, is judged as appropriate for this analysis given the 20-year timeframe and the fact that the majority of the potential development in RFS essential habitat is residential.³⁸
- 188 For landowners in developable areas of essential habitat, the cost of past RFS-related conservation activities includes not only foregone development opportunities for preserved land, but also may include these:
- Habitat restoration or enhancement
 - Preserve fencing, signage, and/or patrols
 - Biological surveys and monitoring
 - Vegetation management, including fuel reduction and pest control.

³⁸ Office of Federal Housing Enterprise Oversight (OFHEO), "House Price Index for the First Quarter of 2004," June 1, 2004, available at <http://www.ofheo.gov/HPI.asp>, U.S. Department of Labor, Bureau of Labor Statistics, Bureau of Labor Statistics data, as viewed on June 1, 2004 at www.bls.gov

Table 15
U.S. Fish & Wildlife Service
Draft Economic Analysis for Critical Habitat Designation for the RFS
Residual Land Value Calculation for a Single-Family Residential Product

Cash-Flow Item	Calculation	Amount
Project Summary		
Avg. Price Per Unit [1]		\$427,000
Avg. sq.ft. / Unit		2,092
Avg. FAR		0.4
Avg. # of Units / Gross Acre		5.0
Net to Gross Ratio [2]		20%
Units per Net Acre		6.3
Avg. Lot Size		5,230
Revenues		
Avg. Price Per Unit [1]		\$427,000
Avg. Price per SF		\$204
Total Revenues / Gross Acre		\$2,135,000
Direct Costs (excluding land)		
Building costs / Sqft.		\$103
Total		\$1,077,458
In Tract Costs / lot		\$16,500
Total		\$82,500
Subtotal Direct Costs		\$1,159,958
Indirect Costs (excluding land)		
Planning & Entitlement	0.35% of direct costs	\$4,060
Fees & Permits	3.00% of direct costs	\$34,799
Architecture & Engineering	1.65% of direct costs	\$19,139
Construction Management	2.00% of direct costs	\$23,199
General & Administrative	3.00% of direct costs	\$34,799
Financing & Charges	5.00% of direct costs	\$57,998
Sales & Marketing	5.00% of unit value	\$57,998
Contingency	3.00% of direct costs	\$34,799
Subtotal Indirect Costs		\$266,790
Total Development Costs		\$1,426,749
Per Unit		\$285,350
Per Sqft.		\$136
Developer Profit [3]		\$427,000
Per Unit		\$85,400
Residual Land Value		
Project Wide		\$281,251
Per Unit		\$56,250
Land Value/Unit Sales Price		13.17%

"land_price"

Source: Economic & Planning Systems, Inc.

[1] Represents the average of median home prices in eight counties from 1998 to 2002, inflated to 2004 dollars, based on data from RAND.

[2] Based on data from RS Means.

[3] Assumes a 25% standard real estate industry pre-tax return on investment criterion. Investment includes land, direct, and indirect costs.

189 In the regional HCP and section 7 consultation documents reviewed as part of this analysis, these conservation requirements are typically not obligations of the project owner in perpetuity and usually cost less than \$15,000 per preserved acre.³⁹ Because each preserved acre is likely to contain the entire vernal pool's surface area (after seasonal formation of the standing water) and some portion of the vernal pool's uplands, the actual cost may be below \$15,000 per acre as a smaller amount of vernal pool surface area generally is preserved compared to the full preserve land area in southern California.

190 For each acre identified by the analysis as preserved in whole or part for the RFS since its listing, this analysis estimates the economic impact as the net present value of foregone development opportunities for the value of the preservation acreage. Since 1993, land values in urbanizing areas of Southern California range from \$100,000 to \$260,000 per acre with several exceptions, making the land value the primary cost component of the economic impact. Hence, the economic impact for landowners in developable areas of essential habitat focuses exclusively on assigning an appropriate land value to the site of the acreage preserved since listing. These land values are listed by county and habitat subregion in **Table 16**.

Conversion of Impacts into Current Year Dollars

191 For impacts to landowners in developable areas of essential habitat that have taken place since the listing of the RFS, **Appendix D** shows the data collected to describe the average new home price for each habitat subregion in each year since 1993. For each of 12 years since the listing, a present value of an acre set aside for the RFS depends on the number of years since the landowner would have otherwise developed the property. Development each year since set aside is assumed equivalent to an investment expected to earn 7 percent returns until the current year. Because no data describes the year in which the land was set aside, the impact to the preserved acre is therefore the average of 12 years of compounding investments.

192 An "average value over 12 years" approach best quantifies impacts since listing, because the analysis does not have comprehensive or reliable data on the date of land development that resulted in the RFS habitat preservation.

193 For impacts to landowners in areas of developable essential habitat in future years, as shown in the final column of **Table 16**, additional assumptions come into play. First, the preserved acre's value is set at 2003 prices, and development is assumed to be phased over 20 years so that one-twentieth of the acre is developed each year. Second, each future land value is appreciated at a 4.25 percent annual rate, as described in the previous section. Finally, to calculate an average present land value of an acre equally likely to develop in one of the next 20 years, twenty separate current acre values are discounted at a 7-percent rate for each year until

³⁹ Personal interviews with senior staff from Conservation Resources, LLC (Sacramento, CA) and Helix Environmental Planning, Inc. (Tustin, CA) in 2002 and 2003.

Table 16
U.S. Fish & Wildlife Service
Draft Economic Analysis for Critical Habitat Designation for the RFS
Land Valuation Equivalents for Past and Future Development Gains [1]

County / Habitat Subregion	2003 Price per Gross Developable Acre	Discounted Value of Land	
		Land Developed Since Listing	Land Developed 2005-2024
	<i>2003\$ per gross acre</i>	<i>2004\$ per gross acre</i>	<i>2004\$ per gross acre</i>
Ventura County			
Carlsberg Ranch/Tierra Rajada	\$492,000	\$372,000	\$458,000
Los Angeles County			
Cruzan Mesa	\$283,000	\$269,000	\$254,000
LAX	\$122,000	\$319,000	\$110,000
Orange County			
Fomer MCAS El Toro	\$334,000	\$278,000	\$301,000
Saddleback Meadows	\$500,000	\$442,000	\$459,000
Viejo Conservation Bank [2]	\$260,695	\$222,000	\$229,000
Tijeras Creek	\$760,000	\$529,000	\$723,000
Chiquita Ridge	\$342,000	\$415,000	\$299,000
Radio Tower Road	\$342,000	\$415,000	\$299,000
Riverside County			
Lake Elsinore	\$139,000	\$167,000	\$162,000
Santa Rosa Plateau	\$227,000	\$295,000	\$184,000
Schleuniger Pool/Clayton Ranch	\$211,000	\$202,000	\$234,000
Scott Road	\$179,000	\$159,000	\$160,000
Banning	\$142,000	\$154,000	\$122,000
Former March AFB	NO DATA	NO DATA	NO DATA
Skunk Hollow/Johnson Ranch	\$208,000	\$191,000	\$184,000
San Diego County			
Otay Mesa Region	\$152,000	\$164,000	\$136,000

"past and future"

Notes:

- [1] Based on unknown dates of past development and uncertain dates of future development. Past development impact is assumed to be probability-weighted by distributing the value of the impacted acre over 11 years' time (1993-present). Future development impact similarly is assumed to be probability-weighted by distributing the value of the impacted acre over 20 years' time (2005-2024). Impacts from past development represent foregone income invested at a rate of 7% annually. Impacts from future development represent foregone future income at a social discount rate of 7%, per OMB guidance. Land values are escalated at a rate of 4.25% per year.
- [2] No price data were available for this area during 2003. Value shown is estimated by inflating 2002 prices. The rate used is the average annual increase in housing prices for that area since 1993.

194 development.⁴⁰ Hence, the impact to any developable acre set aside in essential habitat is therefore the average of twenty discounted land values.

As was the case in the treatment of past impacts, the “average value over 20 years” approach is preferable for each essential habitat acre identified as developable in the next 20 years, because little data is readily available that would fix the date of future development that impacts RFS habitat. The designation may instantaneously affect the price of land slated for immediate grading and construction of infrastructure, but the designation will also have an instantaneous impact on developable land not yet in the development pipeline.

Potential Future Land Value Losses

Land Proposed for Designation

195 Owners of land proposed for designation are projected to lose between \$36 and \$204 million in real estate development value over the next 20 years. The variability in the impact encompasses a low to high amount of required set aside acreage that depends on vernal pool site geometry, requirements of land use regulations, and planned uses of the site. A large share of the impacts occur in the Saddleback Meadows subregion of Orange County, where 21 to 128 acres of land will likely be set aside for the RFS and not be developed in the next 20 years. Other subregions have affected acreages with lower total value than Saddleback Meadows, such as Chiquita Ridge in Orange County (25 to 148 acres), Cruzan Mesa in Los Angeles County (24 to 145 acres), Otay Mesa in San Diego County (38 to 230 acres), and Tijeras Creek in Orange County (7 to 42 acres). The economic impacts are shown by habitat subregion in **Table 17**.

Land Excluded from Designation

196 Owners of land excluded from the designation are projected to lose between \$27 and \$157 million in real estate development value over the next 20 years. The variability encompasses a low to high amount of required set aside acreage that depends on vernal pool site geometry, requirements of land use regulations, and planned uses of the site. The largest share of impacts will occur in the Santa Rosa Plateau habitat subregion of Riverside County, where between 58 and 349 acres of land may be set aside for the RFS and not developed in the next 20 years. Other subregions have affected acreages with lower total value than Saddleback Meadows, such as Otay Mesa in San Diego County (75 to 451 acres) and Lake Elsinore in Riverside County (27 to 161 acres). The economic impacts are shown by subregion in **Table 18**.

⁴⁰ OMB guidelines specific a 7 percent social discount rate.

Table 17
U.S. Fish & Wildlife Service
Draft Economic Analysis for Critical Habitat Designation for the RFS
Real Estate Development Impacts for Lands Proposed for Designation

County / Habitat Subregion	LANDS PROPOSED FOR DESIGNATION		
	Impacts Since Listing [1]	Impacts 2005-2024 [2]	
	Low 2004\$	Low 2004\$	High 2004\$
Ventura County			
Carlsberg Ranch/Tierra Rajada [3]	\$4,000,000	\$376,000	\$376,000
Los Angeles County			
Cruzan Mesa	-	\$6,601,000	\$37,215,000
LAX	-	-	-
Orange County			
Fomer MCAS El Toro	-	-	-
Saddleback Meadows	\$1,105,000	\$10,572,000	\$59,688,000
Viejo Conservation Bank	-	-	-
Tijeras Creek	-	\$5,405,000	\$30,572,000
Chiquita Ridge	-	\$7,961,000	\$44,819,000
Radio Tower Road	-	-	-
Riverside County			
Lake Elsinore	-	-	-
Santa Rosa Plateau	-	-	-
Schleuniger Pool/Clayton Ranch	-	-	-
Scott Road	-	-	-
Banning	-	-	-
Former March AFB	-	-	-
Skunk Hollow/Johnson Ranch	-	-	-
San Diego County			
Otay Mesa	\$36,513,000	\$5,360,000	\$31,388,000
TOTAL	\$41,618,000	\$36,275,000	\$204,058,000

"included_total"

- [1] Low to high estimate is derived from a range of possible off-site mitigation requirements. Because no data are available that identify the acreage developed per year since RFS listing, the impacts are spread equally over the 1993-2004 period. The impact is expressed as the value today of foregoing gains in land value if these gains are invested at a real annual rate of 7%. Assumes habitat restoration and enhancement costs are small compared to land costs.
- [2] Low to high estimate is derived from a range of possible habitat avoidance regulatory requirements. Because the affected lands are likely to incrementally develop over the next 20 years, the impacts are spread equally of the 2005-2024 period. The impact is expressed as the value today of foregoing gains in land value if discounted to the present at a rate of 7% per OMB guidance. Includes delay costs. Land values are escalated at a rate of 4.25% per year.
- [3] Personal interviews with staff from Lennar found that Lennar had encountered approximately \$4 million in project modification costs for a housing project in the Carlsberg Ranch area. The biological opinion for the project states that pools must be monitored and maintained for 10 years. Monitoring costs are estimated at \$50,000 per year.

Table 18
U.S. Fish & Wildlife Service
Draft Economic Analysis for Critical Habitat Designation for the RFS
Real Estate Development Impacts for Lands Excluded from the Designation

County / Habitat Subregion	LANDS EXCLUDED FROM DESIGNATION		
	Impacts Since Listing [1]	Impacts 2005-2024 [2]	
		Low	High
	2004\$	2004\$	2004\$
Ventura County			
Carlsberg Ranch/Tierra Rajada	-	-	-
Los Angeles County			
Cruzan Mesa	-	-	-
LAX	-	-	-
Orange County			
Fomer MCAS El Toro	-	-	-
Saddleback Meadows	-	-	-
Viejo Conservation Bank	\$544,000	-	-
Tijeras Creek	-	-	-
Chiquita Ridge	-	-	-
Radio Tower Road	-	-	-
Riverside County			
Lake Elsinore	-	\$4,330,000	\$25,979,000
Santa Rosa Plateau [3]	\$16,000,000	\$10,685,000	\$64,111,000
Schleuniger Pool/Clayton Ranch	\$39,927,000	-	-
Scott Road	-	\$196,000	\$1,177,000
Banning	-	\$1,329,000	\$7,974,000
Former March AFB	-	-	-
Skunk Hollow/Johnson Ranch	\$71,725,000	-	-
San Diego County			
Otay Mesa	\$229,706,000	\$10,518,000	\$57,711,000
TOTAL	\$357,902,000	\$27,058,000	\$156,952,000

"excluded_total"

- [1] Low to high estimate is derived from a range of possible off-site mitigation requirements. Because no data are available that identify the acreage developed per year since RFS listing, the impacts are spread equally over the 1993-2004 period. The impact is expressed as the value today of foregoing gains in land value if these gains are invested at a real annual rate of 7%. Assumes habitat restoration and enhancement costs are small compared to land costs.
- [2] Low to high estimate is derived from a range of possible habitat avoidance regulatory requirements. Because the affected lands are likely to incrementally develop over the next 20 years, the impacts are spread equally of the 2005-2024 period. The impact is expressed as the value today of foregoing gains in land value if discounted to the present at a rate of 7% per OMB guidance. Includes delay costs. Land values are escalated at a rate of 4.25% per year.
- [3] Personal interviews with members of the Nature Conservancy found that approximately \$16 million was contributed by the Metropolitan Water District to purchase land in the Santa Rosa Plateau area as off-site mitigation for the flooding of habitat in the Diamond Valley Lake project.

Impacts since the Listing of the RFS

Land Proposed for Designation

197 As shown by **Table 17**, owners of land proposed for designation have lost an estimated \$42 million in real estate development value since the listing of the RFS. Most of the impacts are associated with the Otay Mesa subregions of San Diego County, where 223 acres of land have been identified as preserved in whole or part for the RFS. The other major impact occurs in the Carlsberg Ranch habitat subregion in Ventura County, where costs of project delay, reduced development density, and monitoring are estimated at \$4.0 million.

Land Excluded from Designation

198 Owners of land excluded from the designation have lost an estimated \$358 million in real estate development value since the listing of the RFS. Similar to the lands proposed for designation, most of the impact occurs in the Otay Mesa habitat subregion of San Diego County, where over 1,400 acres of land have been identified as preserved in whole or part for the RFS. Other habitat subregions with major amounts of affected acreage include the Riverside County habitat subregions of Skunk Hollow and Johnson Ranch (375 acres) and Schleuniger Pool/Clayton Ranch (198 acres). The economic impacts are shown by subregion in **Table 18**.

SUMMARY OF ESTIMATED ECONOMIC IMPACTS

199 In total, RFS-related conservation activities will impose a \$463 million to \$761 million cost to landowners of essential habitat for the RFS. The impact is wholly in the form of an opportunity cost of development.

200 As shown by **Table 12**, at least 86 percent of this impact (\$400 million) is attributed to development activities taking place since the listing of the species. In addition, most of the impact (\$385 million to \$514 million, including past and future time periods) occurs on lands excluded from designation. For the next 20 years on lands proposed for designation, the total landowner impact is estimated to be between \$63 and \$361 million.

CAVEATS TO ECONOMIC COST EVALUATION

201 The economic cost impacts estimated in this chapter are based on a series of assumptions that are more likely to overestimate than underestimate the actual cost of the proposed rulemaking. The following factors should be taken under consideration when evaluating the costs described above.

1. **Pre-existing regulations not taken into account.** The costs described above were calculated assuming all project modifications involving RFS habitat are attributable to the proposed rulemaking. In reality, land developers would likely have to implement

many of the same project modifications (and incur the same costs) absent the proposed rulemaking. In particular, in many instances, the USACE would require mitigation for proposed fill of vernal pools irrespective of RFS protection. Several other pre-existing regulations, including approved regional and project-specific HCPs, also exist that provide RFS protection independent of the proposed rulemaking. This analysis ignored all such baseline regulations.

2. **Lost development opportunities not offset by gains in other areas.** This analysis calculates the value of land development losses because of RFS protection as a “net loss” to society. In reality, given the strength of the real estate market and the amount of developable land outside the proposed designation, it is likely that development opportunities forgone because of RFS protection may in fact be offset by additional development elsewhere. While individual landowners in the proposed designation still would experience real economic losses, the “net” economic impact to society would be reduced as landowners outside the proposed designation experience off-setting economic gains.
3. **Economic losses not off-set by economic gains.** This analysis also endeavors to capture the net economic impact imposed on regulated entities and the regional economy resulting from RFS conservation efforts. To the extent possible, the estimated net economic impact should account for any offsetting benefits that might accrue to the regulated community because of their RFS habitat preservation activities. For example, in certain cases real estate development that effectively plans RFS habitat as additional open space might realize a value premium typically associated with on-site open space. Any such premium will offset land preservation costs borne by landowners/developers. Unfortunately, reliable data revealing the premium that the market places on nearby open space in Southern California is not readily available. As such, this analysis does not quantify any offsetting benefits received by the regulated community because of on-site habitat preservation. However, it is likely that any such value is limited given the nature of lands being set aside for habitat.

V. ECONOMIC IMPACTS ON PUBLIC ACTIVITIES

MILITARY TRAINING AND FACILITY OPERATIONS

- 202 This section evaluates the past and future economic costs of RFS-related conservation activities on projects and activities at MCB Camp Pendleton. The Service has proposed to exclude essential RFS habitat that is regarded as critical for fulfillment of the military mission of the military installation. Although economic costs are evaluated for excluded and proposed areas, potential impacts on military readiness is beyond the scope of this analysis.

MCB CAMP PENDLETON

- 203 MCB Camp Pendleton provides training facilities for many active-duty and reserve Marine, Army, and Navy units, as well as national, state, and local agencies. More than 60,000 military and civilian personnel are employed at the base, and it is home to the 1st Marine Expeditionary Force, the 1st Marine Division, the 1st Force Service Support Group, and many tenant units, including elements of Marine Aircraft Group 39 and Marine Corps Tactical Systems Support Activity.
- 204 The training exercises on MCB Camp Pendleton range from small isolated activities to those including several thousand personnel, and include infantry operations, amphibious landings, live fire operations and field maneuvers using wheeled and tracked vehicles. While the base contains housing developments and recreational areas, its main purpose remains for the foreseeable future military training.
- 205 The Service considers approximately 3,903 acres of land on MCB Camp Pendleton to be essential RFS critical habitat. Of this amount, approximately 1,215 acres are proposed acres, and they include a park site leased by Marines to the CDPR and private interests, the Cockleburr Sensitive Area, and non-training land around the Wire Mountain housing area. The remaining 2,688 acres are located on mission-essential training areas of the base and have been proposed for exclusion under the section 4(b)(2) of the Act.
- 206 MCB Camp Pendleton operates an amphibious training base that promotes the combat readiness of military forces and is the only West Coast Marine Corps facility where amphibious operations can be combined with air, sea, and ground assault training activities year-round. Currently, the Marine Corps has no alternative installation available for the types of training that occur on MCB Camp Pendleton.
- 207 Training lands were proposed for exclusion because the Service is already in formal consultation with the Marine Corps on their upland activities to ensure that current and proposed actions will not jeopardize the species' continued existence. The Service therefore believes that the benefits of proposing MCB Camp Pendleton's training areas do not outweigh

the benefits of their exclusion. Furthermore, the Service believes that the exclusion of training lands from the proposed designation will not result in the extinction of the RFS.

208 Despite the proposed exclusion of MCB Camp Pendleton training lands from the proposed designation, this report nevertheless analyzes potential costs of both proposed and proposed exclusion lands. Therefore, several section 7 consultations may be necessary for Camp Pendleton in the next 20 years.

209 As the installation's housing areas are renovated or expanded, training exercises featuring the deployment of new weapon systems are initiated, and infrastructure to support munitions, equipment, vehicles, and other utility and transportation needs is built, projects that may affect the RFS or may adversely modify critical habitat will likely result in some kind of consultation activity. A review of past projects requiring section 7 compliance for MCB Camp Pendleton demonstrates that, because of the installation's ability to avoid vernal pool impacts in the implementation of projects, minimal, if any, project modifications are required as part of the ITP. As exact RFS consultation information was unavailable, a ratio of consultations to essential habitat acreage was found using information from the DEA for the San Diego Fairy shrimp, and then applied to the essential RFS habitat acreage in this analysis. Expected costs were found to be comparatively insignificant and therefore are excluded from the final analysis.

MILITARY BASE DECOMMISSIONING

210 The Service proposes to designate approximately 295 acres of former military base land as RFS critical habitat. This includes nearly 145 acres in Western Riverside County and nearly 150 acres of land in Central Orange County. These lands are located on former military bases selected for decommissioning as part of the Base Realignment and Closure (BRAC) Commission and related actions by the U.S. Congress. No critical habitat in either location is excluded from designation.

MARCH JPA POOLS

211 Portions of the former March AFB in Riverside County contain RFS habitat that is proposed for designation. March AFB land is currently managed as part of a base decommissioning process by the March JPA. The habitat is located on the natural bottom of one of the former base's drainage channels, and JPA planning staff believe that vernal pools currently are found there because flood waters have a greater depth in the drainage that they would otherwise have.

212 Future plans for the former base's land involve a potential widening of the channel to accommodate larger flood events. The current channel is undersized for the commercial and industrial development anticipated by recently published General and Specific Plans provided by the JPA. No capital facilities cost estimates have been developed for the plan areas, however,

and the proportion of vernal pools likely to be affected by an increase in channel capacity is unknown at this point.

- 213 JPA planning staff believes that changes made to the drainage infrastructure will necessitate some take of RFS, permitting of the action through section 7, and involvement of the USACE regarding discharge of fill material to wetlands. At minimum, these regulatory activities may cost the JPA and associated real estate developers and local agencies approximately \$500,000, including the administrative costs necessary under section 7 of the Act. These costs do not include compensation for impacted vernal pools on the channel's natural bottom, but include estimated survey and monitoring work likely to be required of the applicants during construction of additional infrastructure. JPA staff is not aware of any costs that have occurred since the listing of the species.

EL TORO POOLS

- 214 Portions of the former Marine Corps Air Station El Toro in Orange County contain RFS habitat that is proposed for designation. Pools form at this site because of impoundments constructed to reduced water flow into a live firing range operated by the Marine Corps between 1952 until the mid-1990s, when the BRAC selected El Toro for decommissioning. Currently, the site proposed for critical habitat is undergoing a remediation effort led by the EPA, the State Regional Water Quality Control Board, and the State Department of Toxic Substances Control that, upon approval, could result in the future use of the area by the Federal Bureau of Investigation (FBI) for training in explosives. No direct impacts to the pools are anticipated from the construction of FBI facilities on the firing range.
- 215 Staff members of BRAC at El Toro believe that future costs associated with RFS-related regulation could amount to nearly \$150,000, given that a section 7 consultation on the assignment of FBI jurisdiction over the site is likely to include a request from the Service for real time air pollution monitoring. This monitoring effort would focus on particulate matter that could potentially drift from detonation sites into the pools. The effort is likely to continue for several years until the activities at the site are shown to have no measurable impact to the RFS or its habitat.
- 216 In addition, a special remediation program has been put into place to test for contamination of the pools from historical use of live ordnance by the Marine Corps. This program increases the cost of sampling for toxics and screening for ecological impacts compared to costs in neighboring areas where no water impoundment occurs. The total amount to be spent on remediation before the land can be transferred from the Department of Defense to the FBI or to another agency, an event that will probably occur in the next 20 years, may be as high as \$500,000. BRAC remediation staff also estimate that this RFS-related sampling and remediation program has cost the DOD approximately \$500,000 since the listing of the species.

AIR TRANSPORT-FACILITY EXPANSION

LAX POOLS

- 217 Portions of LAX contain RFS habitat that is proposed for designation. While no adult fairy shrimp were found during recent wet season biological surveys, RFS cysts were found during dry season surveys on a total of 1.3 acres (nine of the 52 ephemerally wetted areas on the airfield). All acreage found to contain RFS cysts is located in areas that have been subject to both routine maintenance activities and repeated cut and fill grading. Moreover, the FAA specifically requires the airport to keep the area free of standing water and tall vegetation.
- 218 The agency that operates the airport is currently planning for expansion of facilities, including the possible addition of a new runway, public parking facilities, light-rail systems, and enhanced security. A Master Plan Draft EIS/EIR was completed January 2001. The document evaluates only three of the four possible alternatives, however staff at the FWS believe that each alternative will likely result in the fill and destruction of all pools supporting RFS cysts. In addition, if the “no project” alternative were to be chosen and development avoided, FAA hazard management regulations would require that airport operating personnel keep the pools in conditions inhospitable to RFS growth.
- 219 The LAX Master Plan Draft EIS/EIR states that, were any of the alternatives that resulted in habitat destruction pursued, “habitat occupied by embedded cysts of RFS shall be replaced at a suitable alternate location at a ratio of not more than 1:1”⁴¹. Because on-site pool creation would result in an FAA wildlife hazard, the compensation habitat would be created outside of the planning area for the expansion. One possible location currently being considered is Fairview Park in the City of Costa Mesa⁴², and another possible location is the former Marine Corps Air Station El Toro.
- 220 Regardless of the site selected, the Service may require a monitoring period of no more than 5 years for the created habitat. At a cost of \$500,000 per wetted acre, creation of off site pools is expected to cost approximately \$650,000, while a 5-year monitoring program is expected to cost approximately \$250,000 (at an expected cost of \$50,000 per acre per year) It is assumed there will be a single consultation for project approval at a cost of approximately \$50,000, placing total future costs caused by designation of LAX habitat in the area of \$950,000.

⁴¹ City of Los Angeles, Los Angeles World Airports, *LAX Master Plan Draft EIS/EIR*, available at www.laxmasterplan.org.

⁴² Personal interview in February 2003 with Ken Corey, Consultations Branch, Carlsbad Fish and Wildlife Office, Carlsbad, CA.

ROAD CONSTRUCTION

- 221 Three road projects are expected to cross through RFS critical habitat—State Routes 125, 905, and 11—all in San Diego County. State Route 125 has already been completed, and serves as a four lane highway connection between State Route 905 and State Route 54, as a result of mitigation for the project, 0.7 acres of vernal pool habitat was restored off-site in a preserve located in Otay Mesa.⁴³ Though the RFS was not mentioned in the biological opinion for the project, it is assumed that the species in some way benefited from having the vernal pool habitat preserved. As such, a portion of the total cost has been assigned to the species. The biological opinion for the project lists two other vernal pools species (San Diego fairy shrimp and spreading navarettia); therefore total costs are distributed three ways. At \$500,000 per acre, the estimated total cost of pool restoration comes to \$350,000, or \$140,000 for the RFS. Administrative activities are assumed to cost approximately \$20,000, bringing total RFS cost for the project to \$160,000 before accounting for inflation, as shown in **Table 19**.
- 222 Two additional road projects are expected in the future: State Route 905 and State Route 11. Both are located in the Otay Mesa area of unincorporated San Diego County, but according to Caltrans officials, only the State Route 905 project has surveyed the site for likely acres impacted by the preferred project alternative. State Route 905 is reported to impact 0.02 acre of wetted vernal pools. EPS solicits comment from the public regarding the most likely Caltrans project modifications for this category of economic activity
- 223 If State Route 11 impacts the amount vernal pools seen in other Caltrans project impacts, an estimated 2.0 acres of wetted pools will be require for mitigation.⁴⁴ Using vernal pool restoration costs from other Southern California development projects,⁴⁵ the total costs for both Caltrans projects (State Route 905 and Route 11) over the next 20 years is approximately \$1.0 million before discounting, as shown in **Table 19**. This estimate includes the costs of uplands as well as wetted area; therefore the actual mitigated acreage would be higher than 2.

PASSENGER RAIL SYSTEM CONSTRUCTION

- 224 The Service proposes nearly 145 acres as critical habitat in the City of Carlsbad in Northern San Diego County. All critical habitat land affecting passenger rail system projects has been proposed for designation.

⁴³ Biological Opinion on State Route 125 South, Feb 26, 1999.

⁴⁴Draft Economic Analysis for Vernal Pool Species, Economic & Planning Systems, October 28, 2002.

⁴⁵Personal communication with Barry Jones, HELIX Environmental Consulting, Inc., Poway, California, November 2002.

POINSETTIA LANE TRAIN STATION IN CARLSBAD

- 225 The North County Transit District operates transit systems in numerous cities and unincorporated areas in Northern San Diego County. The District's rail line is called the California Coaster, and vernal pool habitat is located on land owned by the District in the City of Carlsbad. Surveys have documented the presence of RFS, and when the District constructed a Coaster passenger station on this land in 1995, the District was required by State and Federal laws to protect and restore vernal pools during the project and to maintain and monitor the habitat for five years after project completion. District staff estimates that costs to date of vernal pool creation and enhancement, interpretive fencing and signage, and monitoring amount to nearly \$50,000. These costs are shown in **Table 19** as project modification costs; administrative costs of no more than \$20,000 also apply.
- 226 As provided by an interagency agreement with the District, the State Department of Fish and Game will assume responsibility for habitat maintenance in the near future. The cost of this maintenance will be funded from the earnings of a \$50,000 endowment established for this purpose by the District. District staff believes that beyond the creation of the endowment, which is shown in **Table 19** as a project modification cost, the District has no other financial obligations related to the RFS or its habitat.⁴⁶

PARK MAINTENANCE/CONSTRUCTION

O'NEILL PARK

- O'Neill Park, located in southeastern Orange County, covers approximately 3,100 acres. Originally 278 acres of canyon bottom, the park has grown via land donations and purchases over the years, the most recent addition 935 acres donated by the Rancho Mission Viejo Company in 1982. The park supports a variety of public uses, including RV use, horseback riding, camping, and picnicking. In addition, nature tours are provided at various times throughout the year.
- 227 O'Neill Park contains approximately 444 acres of proposed RFS critical habitat, divided among the Saddleback Meadows and Tijeras Creek habitat subregions. While there are vernal pools located in portions of the park, park staff have indicated that none of the park's original or subsequent additions of acreage was specifically preserved or set aside for the RFS. Hence, no costs of acquiring or maintaining land for O'Neill Park has been or will be associated with RFS conservation activities.

⁴⁶ Personal interview in March 2003 with Tom Gallagher, Operations Director, North County Transit District.

Table 19
U.S. Fish & Wildlife Service
Draft Economic Analysis for Critical Habitat Designation for the RFS
Summary of Public Project Impacts Associated with RFS Conservation Activities

Activity	Impacts Since Listing				Impacts 2005-2024			
	Project	Consultation	Total	Total Adjusted for Inflation [1]	Project	Consultation	Total	Discounted Total [2]
	Modifications	Costs			Modifications	Costs		
	uninflated	uninflated	uninflated	2004\$	undiscounted	undiscounted	undiscounted	2004\$
Military Training and Facility Operations								
Marine Corps Base Camp Pendleton	-	-	-	-	-	-	-	-
Military Base Decommissioning								
March Air Force Base	\$450,000	\$50,000	\$500,000	\$745,000	-	-	-	-
Marine Corps Air Station El Toro	\$450,000	\$50,000	\$500,000	\$745,000	\$150,000	\$50,000	\$200,000	\$113,000
Air Transportation Facility Expansion								
Los Angeles World Airport	-	-	-	-	\$900,000	\$50,000	\$950,000	\$538,000
Public Park Improvements								
O'Neil Park	-	-	-	-	-	\$50,000	\$50,000	\$28,000
Rail Construction								
Poinsettia Lane Train Station	\$50,000	\$20,000	\$70,000	\$104,000	\$50,000	-	\$50,000	\$28,000
Road Construction								
SR125	\$140,000	\$20,000	\$160,000	\$239,000	-	-	-	-
SR905	-	-	-	-	\$25,000	\$25,000	\$50,000	\$28,000
SR11	-	-	-	-	\$950,000	\$50,000	\$1,000,000	\$567,000
TOTAL	\$1,090,000	\$140,000	\$1,230,000	\$1,833,000	\$2,075,000	\$225,000	\$2,300,000	\$1,302,000

Source: SANDAG COMP2003 GIS layer

"public"

[1] Past costs are assumed to have been distributed evenly across the 12 years since designation and are inflated at a rate of return of 10% per year.

[2] Future costs are assumed to take place evenly over the next 20 years and are discounted at a social discount cost of 7% per year.

[3] While consultation costs are expected for military lands in the future, they are expected to be under \$50,000 and are therefore excluded from this analysis.

- 228 Staff members at the Orange County Harbors, Beaches, and Parks Department have indicated that no major development projects are likely to occur in the next 20 years that would require project modifications because of the RFS or its habitat. A single section 7 consultation is likely to occur, however, when the Department connects existing park facilities to the County sewer system with Federal grant funding.
- 229 Because the construction would likely be done in areas which have already been developed or in undeveloped areas that do not include RFS habitat, no project modifications are expected. Consultation costs between the Department, the EPA, and the Service are expected to be minimal and would not change the findings of this analysis. Therefore, these administrative costs are not itemized.

VI. OTHER ECONOMIC IMPACTS

230 The previous two chapters provide estimates of impacts from RFS-related conservation activities on a variety of private and public projects. These impacts include costs of project modifications and administrative expenditures associated with by the Federal, State, and local laws that regulate these activities and contribute to RFS habitat protection. In this chapter, other types of economic impacts are evaluated, including impacts to certain projects from CEQA, impacts related to project delays caused by re-initiation of section 7 consultations, and impacts to project applicants and landowners that are generated by regulatory uncertainty and stigma effects.

CEQA-RELATED IMPACTS

231 This section discusses whether implementation of CEQA may indirectly impose costs on projects through RFS-related conservation activities.

INDIRECT EFFECTS ON LARGE PROJECTS THROUGH CEQA

232 Real estate development projects that are responsible for nearly all housing construction and a large share of industrial and commercial construction in California counties are required under CEQA to submit an EIR for public review and consider project alternatives. A lower level of CEQA review, perhaps taking the route of a negative declaration, is highly unlikely. In the process of doing this analysis, a series of consultants who specialize in EIRs were asked whether the presence of critical habitat on the project site added to the cost of preparing the EIR and moving the EIR through public hearings as part of the project's entitlement process.

233 The consensus view in the consultant community is that the designation adds no measurable CEQA-related cost for the project applicant above what would otherwise be required.⁴⁷ First, where listed species are present on the project site, the EIR's biological component will be required to discuss and evaluate habitat impacts, as well as present project alternatives. This requirement is unchanged after Federal designation of critical habitat.

234 Second, where species are not present on the project site, CEQA directs the EIR to inventory the important natural resources are on the project site and characterize project impacts to important habitat types. CEQA makes no reference to critical habitat, and methods used by EIR biologists are unlikely to change if critical habitat is designated. In fact, according to State officials, State agency oversight of the quality and completeness of a project EIR concentrates wholly on the

⁴⁷Personal communication with senior staff from RBF Consulting (San Jose, California), EDAW (Sacramento, California) and HT Harvey & Associates (Watsonville, California), February 24–28, 2003.

biological values of habitat in proximity to the project and on potential project impacts to that habitat, and not on the property's status as federally designated critical habitat.

235 In conclusion, this analysis finds that critical habitat designation for the RFS is unlikely to increase EIR costs above those required under CEQA for any large projects in the counties included in essential habitat. To the extent that they overlap with other Federal protections for the RFS and its habitat, the costs associated with project modifications resulting from the CEQA process are included in **Chapter II**.

INDIRECT EFFECTS ON SMALLER PROJECTS THROUGH CEQA

236 The question of whether the designation can change the public review process for a smaller project that requires a discretionary action by lead agencies in California does not appear to have been answered either by the implementation of CEQA or litigation over the allowable extent of CEQA's exemption language. It is likely that the next 10–20 years will establish a regulatory record or the judicial review required for an adequate assessment of the designation's actual effects.

237 In the absence of empirical evidence, this analysis assumes that State law will disqualify certain classifications of projects from claiming a categorical exemption, if the project is located in essential habitat or designated critical habitat. Second, this analysis assumes that all projects that would have submitted either a mitigated negative declaration or a negative declaration under CEQA before the designation must now complete an EIR because of assumed unavoidable impacts to an environmental resource of critical concern. **Table 20** links the future need for CEQA reviews to growth in population in the five counties with RFS essential habitat.

238 In **Table 21**, the number of projects affected by the critical habitat rulemaking and the cost of the additional CEQA effort is estimated. Over the next 20 years, approximately 160 projects located on lands proposed for designation and 320 projects located on excluded lands may require higher levels of review. The additional review increases the cost of a project originally slated to complete a negative declaration (or mitigated negative declaration) by \$42,500 and increases the cost of a categorically exempt project by \$7,000. For proposed lands, the total additional CEQA cost between 2005 and 2024 is expected to be \$1.9 million, and for excluded lands, the total 2005-2024 cost is estimated at \$3.3 million.⁴⁸

⁴⁸ For the purposes of these calculations, categorical exemptions are assumed to cost \$500, negative declarations/mitigated negative declarations are assumed to cost \$7,500, and environmental impact reviews are assumed to cost \$50,000.

REGULATORY DELAY IMPACTS

- 239 Critical habitat designation for the RFS may lengthen the timeframe for regulatory approvals of real estate development projects if the project is located outside of a regional HCP but has a Federal nexus. In most cases, a decision of the USACE to consider vernal pools as “waters of the United States” establishes the nexus.
- 240 At that point, the project moves through the section 7 process in which technical assistance, or informal or formal consultations are conducted. The need to complete section 7 consultations in and of itself does not automatically delay private development projects, as these consultations can generally be coordinated with other regulatory processes (such as tentative map approvals or action on project EIRs) and do not necessarily increase the time to obtain approvals.
- 241 For development projects that have completed section 7 consultations before the designation, however, delays may occur for land development projects that have not yet been issued final development approvals by local government. Usually, these applicants must re-initiate the consultation to address the potential of adverse modification of habitat modification before final approvals occur.
- 242 This analysis assumes that real estate development projects whose timing is affected by critical habitat are those within 1 year of final project entitlements and permitting. Because the timeframe of this analysis is 20 years, and if projects are assumed to be equally spread over that time period, 5 percent of all projects (1 year’s worth) are impacted by delays. The delay is estimated at 12 months, a reasonable amount of time required to complete the re-initiated consultation with the Service.
- 243 To estimate the additional costs of delay for these development projects, the following method was used:
- Five percent of the total amount of land to be developed over the next 20 years from **Tables 9** through **11** is assumed to be affected by a section 7 re-initiation delay.
 - A carrying cost is calculated for these properties using a 7-percent lending rate for the land acquisition stage of private projects. The length of the delay is assumed to be 1 year. Additional carrying cost is 1 year’s worth of interest on these properties.
- 244 **Tables 22** and **23** summarize the results of the economic cost of delay by habitat subregion. As shown, delays impact six projects on 96 acres of land proposed for designation, while delays impact only 38 acres of land proposed for exclusion. The delay itself causes landowners to pay an extra \$2.3 million in financing for development of property proposed for designation and an extra \$303,000 in financing for property proposed for exclusion.

Table 20
U.S. Fish & Wildlife Service
Draft Economic Analysis for Critical Habitat Designation for the RFS
Projects Requiring CEQA Review, 5 Counties [1]

County	Population [2]	NDs or MNDs [3]	ND/MND Rate	CEs [4]	CE Rate	Projected Population [2]	Projected ND/MND Rate	Total Future ND/MNDs	Total Future CEs
	<i>2000</i> <i>a</i>	<i>per year</i> <i>b</i>	<i>per 1000 people</i> <i>c = b/(a/1000)</i>	<i>per year</i> <i>d = c*2</i>	<i>per 1000 people</i> <i>e = d/(a/1000)</i>	<i>2025</i> <i>f</i>	<i>2025</i> <i>g = c*f</i>	<i>2005-2024</i> <i>h = ((g+b)/2)*20</i>	
Ventura	757,300	268	0.4	536	0.7	1,039,600	368	6,359	12,718
Los Angeles	9,549,400	1,657	0.2	3,314	0.3	10,501,700	1,822	34,792	69,585
Orange	2,857,300	605	0.2	1,210	0.4	3,956,700	838	14,428	28,856
Riverside	3,281,200	938	0.3	1,876	0.6	5,302,800	1,516	24,539	49,078
San Diego	2,825,600	429	0.2	858	0.3	4,026,400	611	10,403	20,806
Total	19,270,800	3,897		7,794		24,827,200	5,155	90,522	181,043

"CEQA_calcs"

[1] Abbreviations used here include these: CE=Categorical Exemption, ND=Negative Declaration, and MND=Mitigated Negative Declaration.

[2] From Woods and Poole, Inc.

[3] From State Department of Finance reports and the California Planner's 2000 Book of Lists, pp. 55-57. ND/MND values are based on a survey of all CA counties and cities. These estimates measure different subtotals of CEQA actions in each jurisdiction compared to the counts of CEQA projects used in **Appendix A**.

[4] Two categorical exemptions are assumed for every negative declaration or mitigated negative declaration.

Table 21
U.S. Fish & Wildlife Service
Draft Economic Analysis for Critical Habitat Designation for the RFS
Additional CEQA Review Costs for Projects in Essential Habitat [1]

Essential Habitat Area/County	NDs/MNDs Located in Essential Habitat	CEs Affected in Essential Habitat	Additional Project Costs after Designation [3]			
			ND/MNDs	CEs	Total	Discounted Total
	[2]	[2]	(nominal \$)	(nominal \$)	(nominal \$)	2004\$
Proposed Lands						
Ventura	-	-	-	-	-	-
Los Angeles	13	26	\$542,000	\$179,000	\$721,000	\$409,000
Orange	31	62	\$1,312,000	\$432,000	\$1,744,000	\$988,000
Riverside	-	-	-	-	-	-
San Diego	16	32	\$672,000	\$221,000	\$893,000	\$506,000
Total Proposed	59	119	\$2,526,000	\$832,000	\$3,358,000	\$1,903,000
Excluded Lands						
Ventura	-	-	-	-	-	-
Los Angeles	-	-	-	-	-	-
Orange	-	-	-	-	-	-
Riverside	72	143	\$3,047,000	\$1,004,000	\$4,051,000	\$2,296,000
San Diego	31	62	\$1,319,000	\$434,000	\$1,753,000	\$994,000
Total Excluded	103	205	\$4,366,000	\$1,438,000	\$5,804,000	\$3,290,000
Total Proposed and Excluded	162	324	\$6,892,000	\$2,270,000	\$9,162,000	\$5,193,000

"CEQA_costs"

[1] Abbreviations used here include CE=Categorical Exemption, ND=Negative Declaration, MND=Mitigated Negative Declaration, and EIR=Environmental Impact Statement.

[2] Calculated using data from Table 20. The number of ND/MNDs or CEs located in critical habitat is found by using a ratio apportionment method based on total county population. The formula used is (total CEs * persons in habitat * percentage of developed habitat used for residential)/(total population). "Persons in habitat" is calculated by using CIRBA-estimated single-family building permits and assuming 5 units per acre and 3 persons per unit. "Percentage of developed habitat used for residential" is taken from the SANDAG report on land use from 1990-1995 and is approximately 53%.

[3] Based on the following project applicant cost assumptions: EIR = \$50,000, ND/MND = \$7,500, CE = \$500.

UNCERTAINTY EFFECTS

- 245 No costs associated with regulatory uncertainty on affected landowners or public agencies have been included in this report. Regulatory uncertainty presupposes that implementation of any of the Federal, state, or local laws protecting RFS or its habitat produces a range of regulatory outcomes, and that land buyers will discount the value of properties to protect themselves from the uncertainty of associated costs.
- 246 Because of the extremely limited distribution of remaining RFS populations and habitat and the very low probability that compensation options that involve lower cost land purchases will be an alternative to on-site avoidance in RFS habitat, the analysis of regulatory uncertainty assumes that landowners anticipate the use of on-site avoidance measures for projects that may disturb RFS habitat. These conservation requirements differ little between the various permitting and environmental review processes inherent in Federal, state, and local land use regulation. As a result, no range of regulatory outcomes will be anticipated by affected landowners, and the cost of uncertainty is zero.

STIGMA EFFECTS

- 247 Separate from regulatory uncertainty costs for owners of land in essential habitat are stigma-related effects. Stigma effects are a form of uncertainty that relate less to observed variation in project modifications and more to perceived fluctuations when there is limited information on actual outcomes. Stigma effects last for a limited time period as increasing levels of information erode the perceived fluctuations, replacing them with a more accurate assessment of the actual uncertainty. They also tend to last only as long as the “fastest learners” remain unclear about the actual uncertainty associated with the designation.
- 248 In a situation where some market actors are clear about the effects and are able to appropriately discount the land values, while others incorporate a stigma and discount the land further, arbitrage is likely to occur—the “fastest learners” will buy the land from others, gradually increasing the land price until it reaches the value of land associated with actual uncertainty discounting only.
- 249 Overall, the stigma effect primarily results in a land value distribution to the “fastest learners” from others, all on the same site. This analysis recognizes that a small fraction of the 6,000 acres of land affected by proposed designation is subject to a short-term stigma effect and that, because of clear regulatory requirements for a listed species such as the RFS, the magnitude of the actual stigma costs is small. Consequently, no estimate of the effect is provided.

Table 22
U.S. Fish & Wildlife Service
Riverside Fairy Shrimp Critical Habitat Draft Economic Analysis
Private Land Development Time Delay Costs for Proposed Lands

County / Habitat Subregion	LANDS PROPOSED FOR DESIGNATION							
	Acreage to Be Developed	Percent Subject to Regional HCPs	Percent Subject to section 7 Re-Initiation	Acreage Subject to Re-Initiation	Land Value of Affected Projects	Additional Time Required to Complete Consultation	Private Sector Lending Rate	Additional Carrying Costs
	[1] <i>over 20 years</i>	[2] <i>over 20 years</i>	[3] <i>over 20 years</i>	<i>over 20 years</i>	<i>2004\$/gross developable acre</i>	<i>months</i>	[4]	[5]
Ventura County								
Carlsberg Ranch / Tierra Rajada	-	0%	5%	-	\$492,000	12 months	7%	-
Los Angeles County								
Cruzan Mesa	482.1	0%	5%	24.1	\$283,000	12 months	7%	\$478,000
LAX	-	0%	5%	-	\$122,000	12 months	7%	-
Orange County								
Fomer MCAS El Toro	-	0%	5%	-	\$334,000	12 months	7%	-
Saddleback Meadows	428.0	0%	5%	21.4	\$500,000	12 months	7%	\$749,000
Viejo Conservation Bank	-	0%	5%	-	\$260,695	12 months	7%	-
Tijeras Creek	139.3	0%	5%	7.0	\$760,000	12 months	7%	\$371,000
Chiquita Ridge	492.4	0%	5%	24.6	\$342,000	12 months	7%	\$589,000
Radio Tower Road	-	0%	5%	-	\$342,000	12 months	7%	-
Riverside County								
Lake Elsinore	-	100%	0%	-	\$139,000	-	-	-
Santa Rosa Plateau	-	100%	0%	-	\$227,000	-	-	-
Schleuniger Pool/Clayton Ranch	-	100%	0%	-	\$211,000	-	-	-
Scott Road	-	100%	0%	-	\$179,000	-	-	-
Banning	-	100%	0%	-	\$142,000	-	-	-
Former March AFB	-	0%	5%	-	NO DATA	12 months	7%	-
Skunk Hollow/Johnson Ranch	-	100%	0%	-	\$208,000	-	-	-
San Diego County								
Otay Mesa Region	766.4	50%	5%	19.2	\$152,000	12 months	7%	\$154,000
TOTAL	2,308.3			96.3				\$2,341,000

"Delay"

Notes:

- [1] Gross developable acreage.
- [2] Projects subject to a regional HCP's permitting process do not require a section 7 incidental take permit and are not expected to be impacted by significant delays or additional carrying costs because of RFS-related conservation activities.
- [3] Projects with completed section 7 consultations will need to re-initiate the consultation upon designation of critical habitat. Because economic activities are projected over the next 20 years, 1/20th or 5% of projects subject to section 7 review will experience a re-initiation. The re-initiation is most likely to require minimal or insignificant project modifications, but the time required may be as long as 12 months.
- [4] Cost of funds for real estate development varies from 5% (phased homebuilding), to 7% (construction and acquisition), to 12% (entitlement and project approval). A re-initiation of a section 7 consultation would take place in the "entitlement and project approval" phase.
- [5] These are investor costs paid to lenders as the term of outstanding loans is extended to allow for completion of a re-initiated section 7 consultation. The costs are incurred in the first year, so no discounting is necessary.

Table 23
U.S. Fish & Wildlife Service
Riverside Fairy Shrimp Critical Habitat Draft Economic Analysis
Private Land Development Time Delay Costs for Excluded Lands

County / Habitat Subregion	LANDS EXCLUDED FROM DESIGNATION							
	Acreage to Be Developed [1] <i>over 20 years</i>	Percent Subject to Regional HCPs [2] <i>over 20 years</i>	Percent Subject to section 7 Re-Initiation [3] <i>over 20 years</i>	Acreage Subject to Re-Initiation <i>over 20 years</i>	Land Value of Affected Projects <i>2004\$/gross developable acre</i>	Additional Time Required to Complete Consultation <i>months</i>	Private Sector Lending Rate [4]	Additional Carrying Costs [5]
Ventura County								
Carlsberg Ranch / Tierra Rajada	-	0%	5%	-	\$492,000	12 months	7%	-
Los Angeles County								
Cruzan Mesa	-	0%	5%	-	\$283,000	12 months	7%	-
LAX	-	0%	5%	-	\$122,000	12 months	7%	-
Orange County								
Fomer MCAS El Toro	-	0%	5%	-	\$334,000	12 months	7%	-
Saddleback Meadows	-	0%	5%	-	\$500,000	12 months	7%	-
Viejo Conservation Bank	-	0%	5%	-	\$260,695	12 months	7%	-
Tijeras Creek	-	0%	5%	-	\$760,000	12 months	7%	-
Chiquita Ridge	-	0%	5%	-	\$342,000	12 months	7%	-
Radio Tower Road	-	0%	5%	-	\$342,000	12 months	7%	-
Riverside County								
Lake Elsinore	535.2	100%	0%	-	\$139,000	-	-	-
Santa Rosa Plateau	1,162.9	100%	0%	-	\$227,000	-	-	-
Schleuniger Pool/Clayton Ranch	-	100%	0%	-	\$211,000	-	-	-
Scott Road	24.6	100%	0%	-	\$179,000	-	-	-
Banning	217.5	100%	0%	-	\$142,000	-	-	-
Former March AFB	-	0%	5%	-	NO DATA	12 months	7%	-
Skunk Hollow/Johnson Ranch	-	100%	0%	-	\$208,000	-	-	-
San Diego County								
Otay Mesa Region	1,503.9	50%	5%	37.6	\$152,000	12 months	7%	\$303,000
TOTAL	3,444.0			37.6				\$303,000

"Delay ex"

[1] Gross developable acreage.

[2] Projects subject to a regional HCP's permitting process do not require a section 7 incidental take permit and are not expected to be impacted by significant delays or additional carrying costs because of RFS-related conservation activities.

[3] Projects with completed section 7 consultations will need to re-initiate the consultation upon designation of critical habitat. Because economic activities are projected over the next 20 years, 1/20th or 5% of projects subject to section 7 review will experience a re-initiation. The re-initiation is most likely to require minimal or insignificant project modifications, but the time required may be as long as 12 months.

[4] Cost of funds for real estate development varies from 5% (phased homebuilding), to 7% (construction and acquisition), to 12% (entitlement and project approval). A re-initiation of a section 7 consultation would take place in the "entitlement and project approval" phase.

[5] These are investor costs paid to lenders as the term of outstanding loans is extended to allow for completion of a re-initiated section 7 consultation. The costs are incurred in the first year, so no discounting is necessary.

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APPENDICES

APPENDIX A: ECONOMIC IMPACT ON SMALL ENTITIES AND
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APPENDIX B: HABITAT SUBUNIT LAND USE DESCRIPTIONS

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APPENDIX A

ECONOMIC IMPACT ON SMALL ENTITIES AND ENERGY

Table A-1	Estimated Total Sales for Small Businesses in Land Development Industry by County	A-6
Table A-2	Estimated Impacts on Small Land Development Businesses in Five County Region	A-7

APPENDIX A: ECONOMIC IMPACT ON SMALL ENTITIES AND ENERGY

250 This appendix considers the extent to which the analytic results presented in the Draft Economic Analysis reflect future impacts to small entities or energy markets. An analysis of the effects of RFS habitat conservation activities on small entities is conducted pursuant to the RFA as amended by the SBREFA in 1996, while the energy analysis is required by Executive Order Number 13211.⁴⁹

SBREFA ANALYSIS

251 Under SBREFA, whenever a Federal agency is required to publish a notice of rulemaking for any proposed or final rule, it must prepare and make available for public comment a regulatory flexibility analysis that describes the effect of the rule on small entities (i.e., small businesses, small organizations, and small government jurisdictions). However, no regulatory flexibility analysis is required if the head of an agency certifies that the rule will not have a significant economic impact on a substantial number of small entities.⁵⁰ SBREFA amended the RFA to require Federal agencies to provide a statement of the factual basis for certifying that a rule will not have significant economic impact on a substantial number of small entities. To assist in this process, the following represents a screening level analysis of the potential effects of future RFS habitat conservation activities on small entities.

IDENTIFICATION OF ACTIVITIES THAT MAY INVOLVE SMALL ENTITIES

252 The Draft Economic Analysis identifies land use activities affected by RFS conservation activities. This section considers the extent to which these economic effects represent impacts to small entities.

253 Because no small entities are expected to directly participate in military training and facility operations, military base decommissioning, airport facility expansion, road construction, passenger rail system construction, or park maintenance and construction in lands proposed for designation, no analysis was applied to these activities. For the parts of these projects related to RFS habitat, only governments and businesses not categorized as small would have a direct participation as a lead agency or prime contractor role. Hence, in the study area, only the real

⁴⁹ 5 U.S.C. 601 *et seq.*

⁵⁰ Thus, for a regulatory flexibility analysis to be required, impacts must exceed a threshold for “significant impact” and a threshold for a “substantial number of small entities.” See 5 U.S.C. 605 (b).

estate development sector is likely to experience small business impacts resulting from the rulemaking.

- 254 As discussed in **Chapter IV**, RFS conservation activities affecting future real estate development projects will be borne by the current landowner, regardless of whether that landowner actually undertakes the development project himself or herself.⁵¹ In many instances, existing landowners may not be businesses but rather individuals holding the land as an investment. Technically, individuals who are not businesses are not included in a screening analysis under the RFA. However, in certain cases (e.g., land that is likely to be developed in the next few years), existing landowners may be development companies who are impacted by the rulemaking. To be conservative, this analysis assumes that all of the landowners impacted by future RFS conservation activities are developers. This assumption is likely to overstate the actual impacts to small land development firms. Impacts to landowners primarily include lost land value and other project modification costs.

ECONOMIC DATA ON POTENTIALLY AFFECTED SMALL ENTITIES

- 255 The Small Business Administration (SBA) defines *small entity* in different ways depending upon the type of establishment under consideration. The SBA considers Land Development companies (NAICS code 237210) to be a small business if they have an annual revenue of less than \$6 million per year. NAICS code 237210 comprises establishments primarily engaged in servicing land and subdividing real property into lots for subsequent sale to builders. Servicing of land may include excavation work for the installation of roads and utility lines. The extent of work may vary from project to project. Land subdivision precedes building activity and the subsequent building is often residential, but may also be commercial tracts and industrial parks. These establishments may do all the work themselves or subcontract the work to others. Establishments that perform only the legal subdivision of land are not included in this industry.

ESTIMATED NUMBER OF POTENTIALLY AFFECTED SMALL ENTITIES

- 256 Information on the number of firms and total sales for the land development sector is presented in **Table A-1** for the counties with RFS essential habitat, based on data from Dun and Bradstreet and the Risk Management Association.⁵² As shown, small businesses make up the majority of establishments in each of the affected sector.

⁵¹ Because a developer will consider the regulatory restrictions associated with a parcel of land before buying the parcel, the landowner is most directly impacted by land use regulations. Any costs associated with RFS conservation activities will be reflected in the price paid for the parcel, and the cost of RFS conservation measures is ultimately borne by current landowners in the form of reduced land values.

⁵² This information was gathered in a Dialog search of File 516, Dun and Bradstreet, "Dun's Market Identifiers" and a proprietary data purchase from the Risk Management Association.

ESTIMATED IMPACTS ON SMALL BUSINESSES

- 256 Impacts to the land development sector are analyzed in **Chapter IV** of the report. Impacts to private landowners and developers consist of the present value of lost development opportunities. These losses reduce the value of developable land based on habitat set-aside requirements that reduce the density of potential development. As a result of the rulemaking, landowners must reduce the price of the raw land used in future development.
- 257 The analysis assumes that small businesses are as likely as large businesses to have a project located in proposed critical habitat. This probability is the ratio of the number of small business development projects to the total number of development projects county-by-county between 2005 and 2024. The analysis does not account for the fact that some of the impacts will accrue to private landowners, rather than real estate development businesses. In addition, this analysis limits the universe of potentially affected entities to include only those in the counties in which essential habitat is located; this interpretation produces a more conservative analysis than including all entities statewide or nationwide.

Number of Affected Small Businesses

- 258 The number of affected small businesses for the land development and real estate industry is estimated in **Tables A-2** and **A-3** based on the following series of calculations for lands proposed for designation (**Table A-2**) and lands proposed for exclusion from the designation (**Table A-3**).
- **Calculate the average annual impact on all land development businesses in habitat proposed for designation or exclusion.** The county by county impact total is taken from **Table ES-1**, and includes all impacts related to land development project modifications, regulatory delay, and CEQA regulation for all developable land in proposed critical habitat for the next 20 years.
 - **Estimate the percentage of revenues attributable to small businesses active in habitat proposed for designation or exclusion.** Using the county by county values shown in **Table A-1**, the revenue total percentage is calculated by dividing the total small business revenues by total revenues for both small and large businesses. The small business portion ranges from 43 percent in Orange County to 50 percent in Los Angeles County.
 - **Calculate the annual financial impact on affected small businesses.** For purposes of this analysis, the ratio of small business revenues to total sector revenues is assumed to be equal to the small business share of the total impact. This calculation assumes that both small and large businesses are affected in the same way by a reduction in revenue caused by a fixed-percentage loss in the value of developable land.
 - **Calculate the annual acreage to be developed in land proposed for designation or exclusion.** This consumption of land used for development in three of the five counties is taken from **Tables 9 and 10** and ranges from 20 acres per year in Los Angeles County to 100 acres per year in Riverside County. Ventura and Riverside Counties are not

shown in **Table A-2** and Los Angeles, Orange, and Ventura Counties are not shown in **Table A-3** because no future development in those counties for areas proposed for designation or exclusion, respectively, is anticipated.

- **Calculate the ratio of acreage to be developed in habitat proposed for designation or exclusion to overall projected acreage to be developed for all five counties.** Using the building permit data shown in **Table 13** and an assumed development density of 5 units/acre, the county-by-county acreage to be developed in each of the next 20 years ranges from 1,323 acres in Orange County to 2,485 acres in Riverside County. The ratio of acreage to be developed in habitat proposed for designation or exclusion to overall acreage to be developed in each of the four counties ranges from 1.4 percent in Los Angeles County to 5.2 percent in San Diego County.
- **Calculate the number of affected development projects in habitat proposed for designation or exclusion.** Data maintained by California's Office of Policy and Research (OPR) tracks the number of CEQA actions taken at the county level each year since 1996. Using this information, an estimate of the total number of development projects is made for the next twenty years. The number of these projects likely to be located in essential habitat is calculated using the habitat acreage ratio from above multiplied by the 20 year total project estimate from OPR. Of all affected development projects, the fraction that is small business projects is assumed to be the same fraction of small businesses in the land development sector overall (see **Table A-1**).
- **Calculate the number of small businesses likely to be affected by RFS conservation activities.** The number of affected projects is assumed to be equal to the number of affected small businesses, if no small business has more than one project affected by RFS conservation activities in any given year. Using the calculated number of affected small business projects from **Tables A-2** and **A-3**, it is estimated that as many as 21 small businesses across three counties (for lands proposed for designation) or as many as 26 small businesses across two counties (for lands proposed for exclusion) will be affected in any given year.

Size of Small Business Effects

259 This analysis examines the level of effect a small business in the land development sector will experience from RFS conservation efforts, as shown in **Tables A-2** and **A-3**. The analysis assumes that the fraction of small business development projects occurring in RFS habitat proposed for designation or exclusion (compared to all development projects) is the same as the fraction of small business development projects occurring on developable land anywhere in the county. The following steps were taken to estimate the effects of RFS conservation efforts on each small land developer's revenues:

- **Calculate the per-business cost.** The per-business annual cost for small businesses is estimated by dividing the sum of the total project modification costs (including lost land value, discounted time delay costs, and indirect CEQA costs), by the number of affected small businesses, county by county.

- **Calculate the per-business effect on annual revenues.** The ratio of per-business cost to per-business annual gross revenues illustrates the magnitude of the effect small businesses in the land development industry are likely to experience as a result of RFS conservation efforts. As shown in **Tables A-2 and A-3**, small businesses are expected to experience a loss of as much as 6.5 percent of their annual revenues for lands proposed for designation and as much as 2.3 percent for lands proposed for exclusion.⁵³ The high impact for lands proposed for designation are expected for Orange County, while the high impact for lands proposed for exclusion are expected for Riverside County. Here all landowners affected by the rulemaking are assumed to be the land developer categorized as a small business. This assumption overstates the true impact to small land development entities.

CAVEATS

260 The estimated impacts on small businesses provided above contain several important assumptions likely to overstate the actual economic impact to these entities. These assumptions are listed here:

- **All property-owners in critical habitat are developers:** As noted above, the analysis assumes that all affected property owners in the RFS designation are also land developers. In reality, a large share of the affected property owners will sell their land to developers at a price that incorporates the expected cost of critical habitat related conservation activities. To the extent this occurs, property owners rather than small land developers will incur the costs estimated herein. As a result, impacts to small developers are likely overstated.
- **Each future development projects is conducted by a separate small business:** The economic impact is based on an estimate of the number of future projects expected to occur in the proposed designation and assumes, on a year by year basis, that each project is conducted by a separate business. To the extent that some of these projects are conducted by the same business, the total number of small businesses affected will be smaller than the amount estimated. However, since a small business is not likely to be conducting two projects in essential habitat simultaneously, the annual impact per project will be the same.
- **Small land development firms are equally likely to pursue projects in essential habitat as large land development firms:** This analysis assumes that small businesses own land slated for development in essential habitat in the same proportion as small businesses occur in the land development sector. In fact, it is likely that large land development firms will undertake a greater proportion of the development projects in

⁵³ The high end of the impact range is generated from the assumption that 30 percent of the development site must be set aside for RFS conservation activities. The actual amount set aside will vary by site and development proposals, and may be as low as 5 percent.

“greenfield” areas while small land development firms undertake a greater proportion “infill projects.” Large firms are often better suited to undertake major projects located outside of urban areas, as these projects tend to be greater in size and require additional effort to complete the planning and entitlement processes, compared to infill projects.

- **The number of affected small business projects is proportional to the number of small businesses:** As estimated in **Table A-1**, small businesses account for between 93 and 96 percent of the total firms in each sector but a much smaller percentage of total sales. However, the analysis assumes that small businesses will account for between 93 and 96 percent of future projects. To the extent that larger businesses account for a disproportionate share of total sector projects, as they do for total sector sales, the actual number of small businesses impacted may be smaller than the amount estimated.

POTENTIAL IMPACTS TO THE ENERGY INDUSTRY

261 Pursuant to Executive Order Number 13211, Federal agencies are required to submit a summary of the potential effects of regulatory actions on the supply, distribution, and use of energy. Two criteria are relevant to this analysis: 1) reductions in electricity production in excess of 1 billion kilowatt-hours per year or in excess of 500 megawatts of installed capacity and 2) increases in the cost of energy production in excess of 1 percent. This proposed critical habitat designation is expected to have minimal impacts on the energy industry.

Table A-1
U.S. Fish & Wildlife Service
Draft Economic Analysis for Critical Habitat Designation for the RFS
Estimated Total Sales for Small Businesses in Land Development Industry by County

Item	Unit	Counties with RFS Essential Habitat					Total All Counties
		Ventura	Los Angeles	Orange	Riverside	San Diego	
Land Developers [1]							
<u>Small Businesses</u>							
Average Annual Sales (Small Bus.) [2]	(in millions)	\$1.6	\$1.6	\$1.6	\$1.6	\$1.5	
No. of Small Businesses		164	2,607	1,192	395	939	5,297
Estimated Small Business Sales	(in millions)	\$265.7	\$4,184.2	\$1,931.0	\$634.0	\$1,450.8	\$8,465.7
<u>Large Businesses</u>							
Average Annual Sales (Large Bus.) [3]	(in millions)	\$40.7	\$40.3	\$40.7	\$40.3	\$38.8	
No. of Large Businesses		6	102	63	29	41	241
Estimated Large Business Sales	(in millions)	\$244.3	\$4,114.6	\$2,565.1	\$1,169.8	\$1,592.1	\$9,685.9

"sbrefa_sales"

Source: Dunn & Bradstreet, Jan. 2004, Small Business Administration (SBA), and Risk Management Association (RMA),
 RS Means: *Square Foot Costs (2004)*

[1] Businesses defined by the NAICS code as "Land Subdivision" (NAICS # 237210).

[2] The Small Business Administration (SBA) considers a business with an gross annual income of \$6 million or less as "small" for this industry category. To compute the average annual income for a small business in the land development industry, 2003 annual sales data from the Risk Management Association (RMA) were used. The total net annual sales, reported by RMA, of all businesses in the land development industry that fall in all income categories under \$6 million was divided by the total number of businesses in all of the same income categories. The average annual income of \$1.5 million was then inflated by a location coefficient factor from RS Means: Square Foot Costs (2004) to adjust for regional costs differences.

[3] To compute the average annual income for a large business in the land development industry, 2003 annual sales data from the RMA was used. The total net annual sales, reported by RMA, of all businesses in the land development industry that fall in all income categories above \$6 million was divided by the total number of businesses in all of the same income categories. The average annual income of \$37.7 million was then inflated by a location coefficient factor from RS Means: Square Foot Costs (2004) to adjust for regional cost differences.

Table A-2
U.S. Fish & Wildlife Service
Draft Economic Analysis for Critical Habitat Designation for the RFS
Estimated Impacts on Small Land Development Businesses in Five-County Region [1], Lands Proposed for Designation

			Impacts to Lands Proposed for Designation							
Item	Formula	Source	Los Angeles		Orange		San Diego		Three-County Average	
			low	high	low	high	low	high	low	high
Total Small Business Impacts										
Total Impacts on Lands Proposed for Designation [2]	a	Table ES-1	\$7,010,000	\$37,624,000	\$24,926,000	\$136,067,000	\$5,866,000	\$31,894,000		
Percent of Sector Revenues Attributable to Small Businesses [3]	b	Table A-1	50%	50%	43%	43%	48%	48%		
Total Impacts on Small Businesses in Critical Habitat [4]	c = a * b		\$3,534,420	\$18,969,901	\$10,705,409	\$58,439,095	\$2,796,785	\$15,206,384		
Number of Affected Small Businesses										
Estimated Annual Acres to Be Developed in Critical Habitat [5]	d	Tables 9 and 10	20	20	50	50	40	40		
Annual Acres to Be Developed Countywide [6]	e	Table 13	1,388	1,388	1,323	1,323	1,545	1,545		
Percent of Development Affected	f = d/e		1.4%	1.4%	3.8%	3.8%	2.6%	2.6%		
Total Number of Development Projects over 20 Years [7]	g	CEQAnet Database	10,239	10,239	3,110	3,110	6,462	6,462		
Number of Affected Projects over 20 Years	h = g * f		148	148	118	118	167	167		
Percent of Projects Conducted by Small Businesses	i	Table A-1	96%	96%	95%	95%	96%	96%		
Number of Affected Small Business Projects over 20 Years	j = i * h		142	142	112	112	160	160		
Small Businesses Affected per Year [8]	k = j/20		7.1	7.1	5.6	5.6	8.0	8.0		
Total Small Businesses per County [9]	l	Table A-1	2,607	2,607	1,192	1,192	939	939		
Percent Affected per Year	m = k/l		0.3%	0.3%	0.5%	0.5%	0.9%	0.9%	0.4%	0.4%
Impact on Small Business Revenue										
Impact per Affected Small Business	n = c/j		\$24,900	\$133,600	\$95,900	\$523,400	\$17,400	\$94,900	\$41,148	\$223,765
Impact per Affected Business per Year [10]			\$5,000	\$26,700	\$19,200	\$104,700	\$3,500	\$19,000	\$8,200	\$44,800
Percent of Revenues Affected [11]		Table A-1	0.3%	1.7%	1.2%	6.5%	0.2%	1.2%	0.5%	2.8%

"prop_sbrefa_impact"

[1] Ventura and Riverside Counties have no planned development for lands proposed for designation, so no small businesses are affected.

[2] Annualized value of Real Estate Impacts and all indirect CEQA impacts taken from **Table ES-1**. Real estate impacts include regulatory delay costs. Only a portion of CEQA impacts are related to private land development.

[3] Estimated using annual revenues for small and large businesses as shown in **Table A-1**. Assumes cost impacts per dollar of revenue are the same for both large and small businesses.

[4] Calculated assuming the share of all revenues is equal to the share of all impacts.

[5] Equal to the undeveloped/developable acreage shown in **Tables 9 and 10** and allocated evenly over 20 years.

[6] Calculated using total building permit data for all five counties from **Table 13**. Total permits are allocated evenly over 20 years and assume a residential development density of 5 units/acre.

[7] Estimated using the State Office of Population and Research's countywide tabulations of the frequency of EIRs, Negative Declarations, and Categorical Exemptions between 1996 and 2004.

[8] Assumes that the number of projects affected is equal to the number of small business affected; i.e., projects in essential habitat are not concentrated in certain businesses.

[9] As shown in **Table A-1**.

[10] Small business costs are annualized over 5 years based on a 7% discount rate to account for the manner and duration that these costs are likely to be absorbed.

[11] Calculated assuming an annual income of approximately \$1.6 million per business, as described in **Table A-1**.

Table A-3
U.S. Fish & Wildlife Service
Draft Economic Analysis for Critical Habitat Designation for the RFS
Estimated Impacts on Small Land Development Businesses in Five County Region [1], Lands Proposed for Exclusion

Item	Formula	Source	Impacts to Lands Proposed for Exclusion					
			Riverside		San Diego		Two County Average	
			low	high	low	high	low	high
Total Small Business Impacts								
Total Impacts on Lands Proposed for Exclusion [2]	a	Table ES-1	\$18,836,000	\$101,537,000	\$5,866,000	\$31,894,000		
Percent of Sector Revenues Attributable to Small Businesses [3]	b	Table A-1	35%	35%	48%	48%		
Total Impacts on Small Businesses in Excluded Habitat [4]	c = a * b		\$6,620,198	\$35,686,720	\$2,796,785	\$15,206,384		
Number of Affected Small Businesses								
Annual Acres to Be Developed in Excluded Habitat [5]	d	Tables 9 and 10	100	100	80	80		
Annual Acres to Be Developed Countywide [6]	e	Table 13	2,485	2,485	1,545	1,545		
Percent of Development Affected	f = d/e		4.0%	4.0%	5.2%	5.2%		
Total Number of Development Projects over 20 Years [7]	g	CEQAnet Database	5,052	5,052	6,462	6,462		
Number of Affected Projects over 20 Years	h = g * f		203	203	335	335		
Percent of Projects Conducted by Small Businesses	i	Table A-1	96%	96%	96%	96%		
Number of Affected Small Business Projects over 20 Years	j = i * h		196	196	321	321		
Small Businesses Affected per Year [8]	k = j/20		9.8	9.8	16.0	16.0		
Total Small Businesses per County [9]	l	Table A-1	395	395	939	939		
Percent Affected per Year	m = k/l		2.5%	2.5%	1.7%	1.7%	1.9%	1.9%
Impact on Small Business Revenue								
Impact per Affected Small Business	n = c/j		\$33,800	\$182,400	\$8,700	\$47,400	\$18,213	\$98,567
Impact per Affected Business per Year [10]	o		\$8,300	\$36,500	\$1,700	\$9,500	\$800	\$3,900
Percent of Revenues Affected [11]		Table A-1	0.5%	2.3%	0.1%	0.6%	0.1%	0.2%

"excl_sbrefa_impact"

- [1] Los Angeles, Orange, and Ventura Counties have no planned development for lands proposed for exclusion, so no small businesses are affected.
- [2] Annualized value of Real Estate Impacts and all indirect CEQA impacts taken from **Table ES-1**. Real estate impacts include regulatory delay costs. Only a portion of CEQA impacts are related to private land development.
- [3] Estimated using annual revenues for small and large businesses as shown in **Table A-1**. Assumes cost impacts per dollar of revenue are the same for both large and small businesses.
- [4] Calculated assuming the share of all revenues is equal to the share of all impacts.
- [5] Equal to the undeveloped/developable acreage shown in **Tables 9 and 10** and allocated evenly over 20 years.
- [6] Calculated using total building permit data for all five counties from **Table 13**. Total permits are allocated evenly over 20 years and assume a residential development density of 5 units/acre.
- [7] Estimated using the State Office of Population and Research's countywide tabulations of the frequency of EIRs, Negative Declarations, and Categorical Exemptions between 1996 and 2004.
- [8] Assumes that the number of projects affected is equal to the number of small business affected, i.e. projects in essential habitat are not concentrated in certain businesses.
- [9] As shown in **Table A-1**.
- [10] Small business costs are annualized over 5 years based on a 7% discount rate to account for the manner and duration that these costs are likely to be absorbed.
- [11] Calculated assuming an annual income of approximately \$1.6 million per business, as described in **Table A-1**.

APPENDIX B

HABITAT SUBUNIT LAND USE DESCRIPTIONS

Table B-1	List of Proposed Subunits in Critical Habitat Subregions.....	B-7
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APPENDIX B: HABITAT SUBUNIT LAND USE DESCRIPTIONS

263 This appendix provides additional information, when available, about land uses and ownership for many of the habitat subregions discussed in this analysis. While costs are largely discussed in the main chapters of the report, these sections offer a context for the economic activities and the impacts suggested by the analysis. The order of the subregions presented below is from north to south and west to east. **Table B-1** shows a correspondence between the habitat subregion place names used in this analysis and the habitat subunits defined by the Service in its April 27, 2004, RFS Proposed Designation of Critical Habitat.

CARLSBERG RANCH/TIERRA RAJADA (512 PROPOSED ACRES)

264 Carlsberg Ranch, located south of State Highway 118 and west of State Highway 23 in Ventura County, covers approximately 74.1 acres of critical habitat. It is home to a single known natural pool, which has been modified in the past by cattle ranchers to serve as a pond and water source for cattle. Since then, the land has been purchased and developed, and currently houses a project done by Lennar Homes. The project has taken measures to preserve the vernal pool on-site, thorough a combination of avoidance and project modification. No further development is expected in the area.⁵⁴

265 Tierra Rajada, located southeast of the Carlsberg Ranch subregion, covers approximately 437 acres. The Tierra Rajada subregion falls partially in the city of Thousand Oaks and partially in the city of Simi Valley. The majority of the region, however, falls in unincorporated Ventura County. According to an interview with a member of the Service, the land is privately owned by a single individual who has no intent of selling or developing in the foreseeable future.

⁵⁴ Completed in 2000, the Lennar Homes project underwent a series of project modifications in an attempt to avoid destruction of RFS habitat. Because of a variety of environmental concerns, a total of 17 single family lots were eliminated from the original plan (resulting in 127 lots for the modified plan), 6 of which were specifically attributable to RFS habitat avoidance. As the original development plan was created before the presence of endangered species habitat was registered, a significant number of sewer, roads, and drainage changes were also required before the project could begin construction.

At the time of project completion in 2000, Lennar employees estimate that lots were valued at \$150,000, resulting in a lost land cost of approximately \$1.2 million (\$900,000 total land value inflated by 7 percent rate of return on investment for four years). Additional costs were incurred, including biologist, consultant, and lawyer fees, and the project was delayed approximately 2 years. Lennar employees estimate that the total cost of all modifications made to be in the range of \$4 million.

In addition to avoidance, Lennar is required to monitor the pool for a period of 10 years. This is expected to generate an additional cost of \$500,000 (\$50,000 per year), bringing to total past and future costs for Carlsberg Ranch to approximately \$4.5 million.

CRUZAN MESA (534 PROPOSED ACRES)

266 Cruzan Mesa is located in the upper northeastern portion of the city of Santa Clarita, and extends outward into unincorporated Los Angeles County. Personal interviews indicate that a project done by Pardee homes is intended for that area, with private dedication of habitat land to take place resulting in no section 7 consultation. However, no specific information as to the description of the project was available. It is assumed that the City is likely to continue development outward, and therefore all undeveloped acreage in the Cruzan Mesa subregion is treated as developable in the next 20 years.

LAX (104 PROPOSED ACRES)

267 The Los Angeles International Airport (LAX) currently supports and estimated 65 million airline passengers per year, and is the primary provider of air transport in the Los Angeles Metropolitan Region. The region is home to the worlds 11th largest economy, with a gross regional product of nearly \$500 billion. LAX provides approximately 1 out of every 20 jobs in the region, and is responsible for an estimated \$60 billion in annual output.

268 The LAX Master Plan predicts that, because of growth occurring in fringe areas of Riverside and Orange counties, the share of regional demand will decrease in the next 15 years. However, because of general population growth, overall demand is expected to increase. By 2015, LAX predicts it will be moving almost 4.2 million tons of air cargo, 49 million international passengers, and 49 million domestic passengers per year.⁵⁵

269 SCAG data shows a significant amount of land in the LAX habitat subregion has having been preserved (for species other than the RFS). Approximately 67 acres have been developed, the majority of which is public. As the airport is currently considering four different expansion alternatives, it is assumed that the remaining acreage will likely be developed in the next 20 years. Because of the proximity to the airport, it is assumed that all development in the region will be public.

FORMER MCAS EL TORO (137 PROPOSED ACRES, 15 EXCLUDED ACRES)

270 El Toro was officially decommissioned in 1999. Located about 8 miles southeast of the city of Santa Ana, most of the land to its north is agricultural, while most lands to the south are commercial, industrial, and residential development. The former base covers approximately 4,700 acres, and once served as one of the main air facilities for the United States Marine Corps. Future possible uses of the base include conversion to a civilian commercial airport to help

⁵⁵ Draft LAX Master Plan.

accommodate the growing demand for forms of airborne cargo transport in the region, or use as a training facility for the Federal Bureau of Investigations. Because of past uses (aircraft repair, fueling, etc.), both the soil and groundwater are highly contaminated, and as such form of private development is expected in the next 20 years.

SADDLEBACK MEADOWS (756 PROPOSED ACRES)

- 271 Saddleback Meadows is the second largest subregion of proposed critical habitat in Orange County, behind only Radio Tower Road. Approximately 50 acres had been developed as of 2002, about 80 percent of which was private development. The area has been subject to past commercial development, and personal interviews indicate that a residential project may be in the future (though it is currently involved in a CEQA-related lawsuit).
- 272 O'Neill Park has its northernmost portion in the Saddleback Meadows subregion, and covers approximately 280 acres of Saddleback Meadows land. Portions of Saddleback Meadows have also been indicated in various biological opinions for other projects as locations for possible off-site mitigation of RFS habitat. Where possible, any known protected acreage has been considered undevelopable in the next 20 years. This analysis treats all remaining acreage as developable.

TIJERAS CREEK (330 PROPOSED ACRES)

- 273 Tijeras Creek is located in the Coto de Caza region, alongside Highway 241 near Antonio Parkway. Similar to Saddleback Meadows, the Tijeras Creek subregion shares a portion of its acreage with O'Neill Park (approximately 175 acres). According to SCAG data, the area has seen little development, the majority of which has been public. Personal interviews have indicated that Tijeras Creek, originally part of the Rancho Mission Viejo land, was sold off to another developer and used partially as mitigation for a nearby housing project. However, specific information for this project was not available. This analysis considered all lands not already developed or within the boundaries of O'Neill Park as developable in the next 20 years.

CHIQUITA RIDGE (503 PROPOSED ACRES)

- 274 Located in southeastern Orange County, Chiquita Ridge covers approximately 500 acres. Personal interviews with members of the Service indicated that portions of the land may have been used as California gnatcatcher habitat mitigation for a nearby housing development, and that other sections may have been used as a RFS mitigation site for the extension of Antonio Parkway. However, specific information was not available for either of these projects. SCAG data indicates that only around 10 acres had been developed as of 2002, leaving the majority categorized as Vacant Undifferentiated. For the purposes of this analysis, all undeveloped land has been considered for development in the next 20 years.

RADIO TOWER ROAD (757 PROPOSED ACRES)

- 275 Radio Tower Road is the largest of the subregions in Orange County (though it is less than a full acre larger than Saddleback Meadows). It is the furthest south of the subregions in Orange County, located alongside Highway 74 where it meets Antonio Parkway. Personal interviews with members of the Service indicate that this land is privately owned and not intended for development in the near future, and SCAG data lists less than 5 acres as developed. In addition, zoning maps show the Radio Tower Road subregion as zoned for open space. As such, none of the habitat subregion is considered to be developable in this analysis.

VIJEIO CONSERVATION BANK (69 EXCLUDED ACRES)

- 276 The Viejo Conservation Bank and portions of the former military base El Toro are the only excluded subregions in Orange County. At only 69 acres, Viejo is the smallest of the subregions in the County. According to SCAG data, it has seen less than 20 acres of development, the majority of which has been public. However, personal interviews have indicated that the area has been established as a critical habitat mitigation bank. The majority of the land has been set aside for the California gnatcatcher, with approximately 2 acres of set aside specifically for the RFS. As the region is a likely mitigation bank, this analysis assumes that no development will take there in the next 20 years.

BANNING POOL (222 EXCLUDED ACRES)

- 277 The Banning Pool habitat subregion is located on the southern edge of the city of Banning in Riverside County, directly below Highway 60. The subregion has seen little development as of 2002. Its close proximity to the city of Banning, in combination with the lack of protected status for its land area, makes it a likely candidate for future development, and as such is considered completely developable for the purposes of this analysis.

LAKE ELSINORE (561 EXCLUDED ACRES)

- 278 The Lake Elsinore habitat subregion is located on the outskirts of the City of Lake Elsinore, in a floodplain next to Lake Elsinore. According to SCAG data, the lake covers over 30 acres. The subregion has already seen some development (approximately 20 acres), the majority of which has been public. Because of its proximity to the City and the lack of known protected lands, this analysis has assumed that the subregion is completely developable in the next 20 years.

SCOTT ROAD (30 EXCLUDED ACRES)

- 279 Located northeast of the cities of Wildomar and Murrieta, the Scott Road habitat subregion has seen significant development, accounting for over one-third of its total land area. The subregion is east of Antelope Road and straddles Scott Road. Because of its proximity to the city of Murrieta and its lack of known protected lands, the Scott Road habitat subregion is treated as completely developable in the next 20 years.

SCHLEUNIGER POOL/CLAYTON RANCH (205 EXCLUDED ACRES)

- 280 The Schleuniger Pool/Clayton Ranch subregion in Riverside County, located largely in the City of Wildomar between Palomar St. and Antelope Rd., is one of the smaller excluded habitat subregions. According to SCAG data, little development has occurred in the area (less than 5 acres), the majority of which has been private. Personal interviews and biological opinions have indicated that the Schleuniger Pool/Clayton Ranch subregion has been used as a mitigation bank in the past, and likely will continue to be used similarly in the future. As such, this analysis assumes that no land in the subregion is developable in the next 20 years.

SKUNK HOLLOW/JOHNSON RANCH (388 EXCLUDED ACRES)

- 281 The Skunk Hollow/Johnson Ranch habitat subregion is located partly in the northeastern portion of the city of Temecula and partly in unincorporated Riverside County. Some development has occurred in the subregion, and significant development is taking place in surrounding areas. However, similar to the Schleuniger Pool/Clayton Ranch habitat subregion, the Skunk Hollow/Johnson Ranch subregion is mentioned in various biological opinions as a possible mitigation site. In addition, personal interviews have indicated that the Skunk Hollow portion is currently monitored and controlled by the Center for Natural Lands Management. As such, this analysis treats the full undeveloped acreage as preserved.

SANTA ROSA PLATEAU (4,394 EXCLUDED ACRES)

- 282 The Santa Rosa Plateau subregion of essential habitat lies between the I-15 corridor and the Cleveland National Forest in Southwestern Riverside County. It includes portions of the 8,300-acre Santa Rosa Ecological Preserve and other private lands contiguous to the Preserve's northern and western boundaries. Managed by the Nature Conservancy and other conservation organization partners, the Preserve has long been a vernal pool study area and overlaps with as much as 4,100 acres of the essential habitat area.
- 283 Two major habitat acquisition phases created the current Preserve area. The first 3,100 acres of land on two mesas were purchased for \$6 million, and more recently, 3,800 acres of land between the mesas, formerly owned by a developer in the region, were sold to the Conservancy

using \$36 million in funding from the public, State wildlife programs, and the Metropolitan Water District (MWD). MWD required mitigation lands for its Diamond Valley Lake suite of flood control and water storage projects near Winchester and Hemet in Riverside County. The district contributed \$16 million towards the \$36 million purchase price of the second acquisition period.

- 284 The remainder of the essential habitat lands, approximately 1,200 acres in total, is largely privately owned and undeveloped as of 2002. Nature Conservancy staff report that parcels located to the north and west of the Preserve are undergoing rapid subdivision with piecemeal development of home sites on large lots (5 to 40 acres in size). While less than 75 homes have been completed to date, construction has accelerated and homebuilders have recently begun work on one new home site each month.

OTAY MESA (1,121 PROPOSED ACRES, 3,524 EXCLUDED ACRES)

- 285 The Otay Mesa region is located in southern San Diego County, directly adjacent to the Mexican border. The habitat subregion is made up of both proposed and excluded lands, covering a total of over 4,645 acres. The region has seen some development, with approximately 80 privately developed acres and 301 publicly developed acres. However, a significant portion has been protected as well, through a combination of the San Diego MSCP, Federal protection, and project mitigation. Using a General Plan based GIS layer, SANDAG has predicted the amount of development the region is likely to see in the coming 20 years, including up to 2,270 acres of potential development.

Table B-1
U.S. Fish & Wildlife Service
Draft Economic Analysis for Critical Habitat Designation for the RFS
List of Proposed Subunits in Critical Habitat Subregions [1]

County/Habitat Subregion	Subunit in Proposed Designation	Contains Excluded Lands
Ventura County		
Carlsberg Ranch	Unit 1a	
Tierra Rajada	Unit 1b	
Los Angeles County		
Cruzan Mesa	Unit 1c	
LAX	Unit 2a	
	Unit 2b	
Orange County		
Former MCAS El Toro	Unit 2c	
Other Former MCAS El Toro		Yes
Saddleback Meadows	Unit 2d	
Viejo Conservation Bank		Yes
Tijeras Creek	Unit 2e	
Chiquita Ridge	Unit 2f	
Radio Tower Road	Unit 2g	
Riverside County		
Lake Elsinore		Yes
Santa Rosa Plateau		Yes
Schleuniger Pool		Yes
Clayton Ranch		Yes
Scott Road		Yes
Banning		Yes
Former March AFB	Unit 3a	
	Unit 3b	
Skunk Hollow		Yes
Johnson Ranch		Yes
San Diego County		
Pendleton	Unit 2h	
	Unit 4a	
	Unit 4b	
Other Pendleton Lands		Yes
Pointsettia Pools	Unit 4c	
Otay Mesa	Unit 5a	
	Unit 5b	
	Unit 5c	
Other Otay Mesa Lands		Yes

"subunits"

[1] Some habitat subregions include both proposed and excluded lands.

APPENDIX C

REAL ESTATE PRICE SUPPORT TABLES

Table C-1	New Home Price Data by Habitat Subregion	C-2
Table C-2	Entitled Land Prices per Acre, RFS Listing to Present.....	C-3

APPENDIX C: REAL ESTATE PRICE CALCULATIONS

- 286 To calculate past and potential future real estate investment losses that may result from RFS-related conservation activities, a method for calculating the value of affected lands was needed. Price data that assist in this calculation is most readily available for new single family housing from Dataquick, Incorporated (based in San Diego). Based on new single family home prices, the analysis derives entitled land prices.
- 287 The methodology used to estimate prices for raw, entitled land has the following steps:
- **Step 1:** Using GIS data layers including an ESRI zip code coverage and essential habitat coverage provided by the Service, assign each habitat subregion a predominant zip code. Most habitat subregions lay in a single zip code. Some habitat subregions fell with multiple zip codes. In such cases, an average of home prices was calculated by weighting the cost of homes in each applicable zip code by the number of homes sold in that zip code for each year.
 - **Step 2:** Compile Dataquick new single-family housing prices at the zip code level from 1993 (the year RFS listing) to 2003. This housing price data series is shown in **Table C-1**.
 - **Step 3:** Estimate the entitled land price as a percentage of the new home price to be 13 percent of the price of the finished real estate product, as explained in **Chapter IV**. This valuation captures the land in its unimproved state, before infrastructure such as streets or utilities is constructed but after project approval.⁵⁶ In addition, assume a density of five units per gross developable acre. Estimated land prices for each habitat subregion are shown in **Table C-2**.
 - **Step 4:** Multiply the estimated price per acre of land by the acreage preserved for the RFS and account for the uncertain time until development. In cases where the preservation occurred in the past, investment values arising from foregone income are compounded at 7-percent annual rate. In cases where the land is likely to develop sometime in the next 20 years, for each year until development, the value of the land is appreciated at 4.25 percent and then discounted at a rate of 7 percent per year for a net discount of 2.75 percent. Both methods are explained in **Chapter IV**.

⁵⁶ The impacts of RFS-related conservation activities fall most directly on landowners whose undeveloped property change in value because of costs associated with habitat and species protection. For this reason, no infrastructure or finished real estate product values are necessary to calculate the impact. The possibility that larger groups of consumers or producers may be affected by these activities through the regional housing market is discussed in **Chapter IV**.

Table C-1
U.S. Fish & Wildlife Service
Draft Economic Analysis for Critical Habitat Designation for the RFS
New Home Price Data by Habitat Subregion [1]

County/Essential Habitat Subregion [2]	Average Price of All New Homes Sold (nominal \$)										
	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Ventura County											
Carlsberg Ranch/Tijeras Creek	\$264,948	\$255,647	\$263,922	\$257,499	\$253,502	\$319,572	\$344,856	\$444,851	\$477,257	\$524,012	\$747,263
LA County											
Cruzan Mesa	\$180,910	\$202,303	\$232,385	\$230,148	\$241,562	\$262,341	\$307,681	\$307,252	\$314,521	\$329,481	\$429,218
LAX	\$75,000	\$308,000	\$297,125	\$340,000	\$300,000	\$258,667	\$479,667	\$719,167	\$718,000	\$135,750	\$185,000
Orange County											
El Toro	\$204,405	\$222,987	\$198,235	\$189,659	\$201,091	\$248,841	\$305,458	\$334,990	\$387,958	\$327,167	\$507,808
Saddleback Meadows	\$255,508	\$263,882	\$266,337	\$262,561	\$265,142	\$332,839	\$462,823	\$635,274	\$826,696	\$855,742	\$759,050
Live Oak Plaza	\$204,405	\$222,987	\$198,235	\$189,583	\$201,091	\$217,481	\$393,643	N/A	\$352,354	\$370,836	N/A
Tijeras Creek	\$272,836	\$281,739	\$300,936	\$279,988	\$291,068	\$395,812	\$569,234	\$744,183	\$865,728	\$888,956	\$1,153,857
Chiquita Ridge	\$280,862	\$305,114	\$233,429	\$226,494	\$420,113	\$491,752	\$575,325	\$848,800	\$481,833	\$457,764	\$519,095
Radio Tower Road	\$280,862	\$305,114	\$233,429	\$226,494	\$420,113	\$491,752	\$575,325	\$848,800	\$481,833	\$457,764	\$519,095
Riverside County											
Lake Elsinore	\$135,828	\$139,461	\$137,714	\$138,105	\$136,666	\$141,343	\$161,497	\$199,179	\$181,061	\$225,438	\$277,373
Santa Rosa Plateau	\$408,333	\$307,222	\$192,000	\$342,333	\$265,500	\$80,000	\$279,958	\$383,264	\$380,031	\$307,868	\$345,140
Schleuniger Pool/Clayton Ranch	\$162,423	\$152,409	\$151,536	\$159,367	\$157,995	\$175,377	\$196,335	\$230,409	\$257,108	\$267,035	\$320,685
Scott Road	\$122,471	\$122,837	\$136,173	\$155,780	N/A	\$162,265	\$181,068	\$199,072	\$215,226	\$233,818	\$272,462
Banning	\$138,230	\$151,846	\$145,991	\$128,703	\$124,753	\$136,425	\$146,340	\$163,553	\$182,095	\$198,052	\$215,337
March AFB											
Skunk Hollow/Johnson Ranch	\$151,071	\$154,673	\$135,951	\$133,932	\$150,118	\$170,137	\$209,555	\$231,779	\$246,693	\$270,473	\$316,178
San Diego County											
Otay Mesa	\$101,291	\$110,115	\$141,958	\$142,250	\$152,250	\$170,039	\$206,181	\$194,980	\$197,143	\$232,927	\$230,289

"weighted_price"

Source: Dataquick

[1] Only areas containing private developable land are shown.

[2] Price data for areas that fall in multiple data zones are estimated by weighting price information by number of homes sold and the percentage of the designated habitat estimated to be in the zone.

Table C-2
U.S. Fish & Wildlife Service
Draft Economic Analysis for Critical Habitat Designation for the RFS
Entitled Land Prices per Acre, RFS Listing to Present [1]

County/Essential Habitat Subregion	Estimated Price per Gross Developable Acre (nominal\$)										
	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Ventura County											
Carlsberg Ranch	\$175,000	\$168,000	\$174,000	\$170,000	\$167,000	\$210,000	\$227,000	\$293,000	\$314,000	\$345,000	\$492,000
Los Angeles County											
Cruzan Mesa	\$119,000	\$133,000	\$153,000	\$152,000	\$159,000	\$173,000	\$203,000	\$202,000	\$207,000	\$217,000	\$283,000
LAX	\$49,000	\$203,000	\$196,000	\$224,000	\$198,000	\$170,000	\$316,000	\$474,000	\$473,000	\$89,000	\$122,000
Orange County											
Fomer MCAS El Toro	\$135,000	\$147,000	\$131,000	\$125,000	\$132,000	\$164,000	\$201,000	\$221,000	\$256,000	\$215,000	\$334,000
Saddleback Meadows	\$168,000	\$174,000	\$175,000	\$173,000	\$175,000	\$219,000	\$305,000	\$418,000	\$545,000	\$564,000	\$500,000
Viejo Conservation Bank	\$135,000	\$147,000	\$131,000	\$125,000	\$132,000	\$143,000	\$259,000	N/A	\$232,000	\$244,000	N/A
Tijeras Creek	\$180,000	\$186,000	\$198,000	\$184,000	\$192,000	\$261,000	\$375,000	\$490,000	\$570,000	\$586,000	\$760,000
Chiquita Ridge	\$185,000	\$201,000	\$154,000	\$149,000	\$277,000	\$324,000	\$379,000	\$559,000	\$317,000	\$302,000	\$342,000
Radio Tower Road	\$185,000	\$201,000	\$154,000	\$149,000	\$277,000	\$324,000	\$379,000	\$559,000	\$317,000	\$302,000	\$342,000
Riverside County											
Lake Elsinore	\$89,000	\$92,000	\$91,000	\$91,000	\$90,000	\$93,000	\$106,000	\$131,000	\$119,000	\$148,000	\$183,000
Santa Rosa Plateau	\$269,000	\$202,000	\$126,000	\$225,000	\$175,000	\$53,000	\$184,000	\$252,000	\$250,000	\$203,000	\$227,000
Schleuniger Pool/Clayton Ranch	\$107,000	\$100,000	\$100,000	\$105,000	\$104,000	\$116,000	\$129,000	\$152,000	\$169,000	\$176,000	\$211,000
Scott Road	\$81,000	\$81,000	\$90,000	\$103,000	N/A	\$107,000	\$119,000	\$131,000	\$142,000	\$154,000	\$179,000
Banning	\$91,000	\$100,000	\$96,000	\$85,000	\$82,000	\$90,000	\$96,000	\$108,000	\$120,000	\$130,000	\$142,000
Former March AFB						NO DATA AVAILABLE					
Skunk Hollow/Johnson Ranch	\$100,000	\$102,000	\$90,000	\$88,000	\$99,000	\$112,000	\$138,000	\$153,000	\$162,000	\$178,000	\$208,000
San Diego County											
Otay Mesa Region	\$67,000	\$73,000	\$94,000	\$94,000	\$100,000	\$112,000	\$136,000	\$128,000	\$130,000	\$153,000	\$152,000

"calc_avg"

[1] Applies to all future developed land uses. Assumes average entitled land value is 10% of the average new home price. Also assumes an average residential density of 5 units per acre.

APPENDIX D

SCAG LAND USE DATA SUPPORT TABLES

Table D-1	Adjustments to SCAG Land Use Data.....	D-2
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APPENDIX D: ADJUSTMENT OF LAND USE DATA

- 288 Land use data obtained from the Southern California Association of Governments (SCAG) estimates the amounts of undeveloped acreage for RFS essential habitat. To determine the undevelopable area, the land area in SCAG’s “vacant undifferentiated” use category is added to land in the agricultural use categories. Once the undeveloped area was identified, the analysis attempted to apply General Plan land use designations to determine the amount of developable land area may impacted by RFS-related conservation activities. However, no multi-jurisdictional General Plan data layer exists.
- 289 As a result, the identification of all undeveloped essential habitat as developable over the next 20 years provides a highly conservative estimate of the amount of development expected to occur in any habitat subregion. To better describe development patterns in the next 20 years, additional information about land use constraints in the “vacant undifferentiated” and agricultural categories, when available, was used to adjust the original SCAG estimates. These adjustments are shown in **Table D-1**.
- 290 In most instances, information was available from personal interviews, third party maps, or biological opinions from a section 7 consultation. Adjustments based on this information transferred land from the a developable land use classification to a more appropriate classification. Examples of such adjustments are those done for the Saddleback Meadows and Tijeras Creek habitat subregions. Both habitat subregions, proposed for designation, have acreage that overlaps with the geographic boundaries of O’Neill Regional Park in Orange County. Using GIS data describing the boundaries of O’Neill park, the “vacant undifferentiated” acreage of essential habitat that lay in O’Neill Park was calculated and moved to the undevelopable land use category. This adjustment is noted both in the footnotes of **Table 10** and in **Table D-1** as well.

Table D-1
U.S. Fish & Wildlife Service
Draft Economic Analysis for Critical Habitat Designation for the RFS
Adjustments to SCAG Land Use Data [1]

County/Habitat Subregion	Developable Acreage			Adjustment Source
	SCAG Data	Adjustments Made	Used in the EA	
	<i>a</i>	<i>b</i>	<i>c = a - b</i>	
Ventura County				
Carlsberg Ranch/Tierra Rajada	481	481	-	[2] [3]
Los Angeles County				
Cruzan Mesa	480	-	480	-
LAX	52	52	-	[4]
Orange County				
Fomer MCAS El Toro	22	22	-	[2]
Saddleback Meadows	685	270	415	[2] [3] [5]
Viejo Conservation Bank	66	55	11	[2]
Tijeras Creek	300	170	130	[5]
Chiquita Ridge	480	-	480	-
Radio Tower Road	733	753	20	[5]
Riverside County				
Lake Elsinore	535	-	535	-
Santa Rosa Plateau	1,160	-	1,160	-
Schleuniger Pool/Clayton Ranch	198	198	-	[2]
Scott Road	25	-	25	-
Banning	220	-	220	-
Former March AFB	-	-	-	-
Skunk Hollow/Johnson Ranch	375	375	-	[2]
TOTAL	5,811	2,375	3,440	

"SCAG adjustment"

[1] Includes proposed and excluded lands. More detailed acreage information is available in **Tables 10 and 11**.

Numbers may be rounded.

[2] Adjustment made because of information from personal interviews.

[3] Adjustment made because of information from biological opinions and other similar legal documents.

[4] It was assumed that, because of proximity to the airport, the land would not be used for private development.

[5] Adjustment made because of information from maps, GIS or otherwise.

APPENDIX E

RFS DEA RESULTS, 3-PERCENT DISCOUNT RATE

Table E-1	Summary of Impacts to Lands Proposed for Designation— 3% Discount Rate	E-3
Table E-2	Summary of Impacts to Lands Excluded from Designation— 3% Discount Rate	E-4

APPENDIX E: RFS DEA RESULTS, 3-PERCENT DISCOUNT RATE

- 291 The most current Office of Management Budget (OMB) guidance on discounting practices to be used in regulatory analysis is provided in OMB Circular A-4.⁵⁷ OMB circular A-4 states that:

*[a] real discount rate of 7 percent should be used as a base-case for regulatory analysis. The 7 percent rate is an estimate of the average before-tax rate of return to private capital in the U.S. economy. It is a broad measure that reflects the returns to real estate and small business capital as well as corporate capital. It approximates the opportunity cost of capital, and it is the appropriate discount rate whenever the main effect of a regulation is to displace or alter the use of capital in the private sector.*⁵⁸

- 292 OMB Circular A-4 also recommends using other discount rates to show the sensitivity of the estimates to the discount rate assumption. When regulation affects private consumption, a lower discount rate is appropriate. OMB Circular A-4 states that “for regulatory analysis, you should provide estimates of net benefits using both 3 percent and 7 percent.”⁵⁹ A 3-percent discount rate is justified in the following manner:

*If we take the rate that the average saver uses to discount future consumption as our measure of the social rate of time preference, then the real rate of return on long-term government debt may provide a fair approximation. Over the last thirty years, this rate has averaged around 3 percent in real terms on a pre-tax basis. For example, the yield on 10-year Treasury notes has averaged 8.1 percent since 1973 while the average annual rate of change in the CPI over this period has been 5.0 percent, implying a real 10-year rate of 3.1.*⁶⁰

- 293 **Appendix E** presents results of the RFS DEA in a manner similar to **Tables ES-1** and **ES 2** by using a discount rate of 3 percent. As shown in **Table E-1**, costs for lands proposed for designation range from \$54.1 million to \$292.9 million for future impacts. Impacts occurring since the listing of the RFS on lands proposed for designation total

⁵⁷ Executive Order 12866, “Regulatory Planning and Review,” September 30, 1993; U.S. Office of Management and Budget, “Circular A-4,” September 17, 2003, available at <http://www.whitehouse.gov/omb/circulars/a004/a-4.pdf>.

⁵⁸ Ibid.

⁵⁹ Ibid.

⁶⁰ Ibid.

\$36.1 million.⁶¹ **Table E-2** shows the \$297.7 million in costs since the listing and the \$43.7 million to \$230.2 million in future costs for lands excluded from designation.

⁶¹ In an attempt to maintain consistency with the 3-percent OMB discount rate, the assumed opportunity cost of real estate development introduced in **Chapter IV** also was changed to 3 percent for both proposed and excluded lands. This rate is used to evaluate impacts to landowners who have experienced RFS-related reductions in development density since the listing.

Table E-1
U.S. Fish & Wildlife Service
Draft Economic Analysis for Critical Habitat Designation for the RFS
Summary of Impacts to Lands Proposed for Designation - 3% Discount Rate

Economic Activity/ Habitat Subregion	LANDS PROPOSED FOR DESIGNATION [1] [2]				
	Cost Impacts Since Listing [3]	Cost Impacts 2005-2024 [4]			
		Total		Per Acre	
		Low	High	Low	High
	2004\$	2004\$	2004\$	2004\$	2004\$
REAL ESTATE DEVELOPMENT					
Ventura County					
Carlsberg Ranch/Tierra Rajada	\$4,000,000	\$439,000	\$439,000	\$900	\$900
Los Angeles County					
Cruzan Mesa	-	\$9,194,000	\$52,773,000	\$17,200	\$98,900
LAX	-	-	-	-	-
Orange County					
Fomer MCAS El Toro	-	-	-	-	-
Saddleback Meadows	\$934,000	\$14,732,000	\$84,648,000	\$19,500	\$111,900
Viejo Conservation Bank	-	-	-	-	-
Tijeras Creek	-	\$7,536,000	\$43,362,000	-	\$131,400
Chiquita Ridge	-	\$11,083,000	\$63,550,000	\$22,000	\$126,400
Radio Tower Road	-	-	-	-	-
Riverside County					
Lake Elsinore	-	-	-	-	-
Santa Rosa Plateau	-	-	-	-	-
Schleuniger Pool/Clayton Ranch	-	-	-	-	-
Scott Road	-	-	-	-	-
Banning	-	-	-	-	-
Former March AFB	-	-	-	-	-
Skunk Hollow/Johnson Ranch	-	-	-	-	-
San Diego County					
Otay Mesa	\$29,997,000	\$7,564,000	\$44,615,000	\$6,700	\$39,800
Subtotal, Real Estate Development	\$34,931,000	\$50,548,000	\$289,387,000		
MILITARY TRAINING					
Pendleton, San Diego County	-	-	-	-	-
MILITARY BASE DECOMMISSIONING					
Former March AFB, Riverside County	\$591,000	-	-	-	-
Fomer MCAS El Toro, Orange County	\$532,000	\$138,000	\$138,000	\$1,000	\$1,000
Subtotal, Military Base Decommissioning	\$1,123,000	\$138,000	\$138,000		
AIRPORT EXPANSION					
LAX, Los Angeles County	-	\$728,000	\$728,000	\$7,000	\$7,000
PUBLIC PARK IMPROVEMENTS					
O'Neill Park, Orange County	-	\$38,000	\$38,000	\$50	\$50
RAIL CONSTRUCTION					
Poinsettia Lane Train Station, San Diego County	\$83,000	\$38,000	\$38,000	\$300	\$300
ROAD CONSTRUCTION					
SR125, San Diego County	-	-	-	-	-
SR905, San Diego County	-	-	-	-	-
SR35, San Diego County	-	-	-	-	-
Subtotal, Road Construction	-	-	-		
INDIRECT COSTS					
CEQA	-	\$2,573,000	\$2,573,000		
TOTAL, ALL ECONOMIC ACTIVITIES	\$36,137,000	\$54,063,000	\$292,902,000		
Annualized Impact [5]	\$3,011,000	\$5,103,000	\$27,648,000		

[1] Dashes indicate a value of zero.
[2] Affected areas may differ from those in the proposed rule. Data used in the DEA are current as of January 26, 2003.
[3] Expressed in current year constant dollars. Past year real estate impacts are escalated based on foregone gains in land value that are assumed to be invested at a 3% annual rate. Past year public activities (all other activity categories) are escalated at a 3% social discount rate.
[4] Expressed in current year constant dollars. All impacts are discounted at a 3% social discount rate. Cost of regulatory delay is included.
[5] Expressed as an annuity payment at a 3% social discount rate.

"F-1"

Table E-2
U.S. Fish & Wildlife Service
Draft Economic Analysis for Critical Habitat Designation for the RFS
Summary of Impacts to Lands Excluded from Designation - 3% Discount Rate

Economic Activity/ Habitat Subregion	LANDS EXCLUDED FROM DESIGNATION [1] [2]				
	Cost Impacts Since Listing [3]	Cost Impacts 2005-2024 [4]			
		Total		Per Acre	
		Low	High	Low	High
	2004\$	2004\$	2004\$	2004\$	2004\$
REAL ESTATE DEVELOPMENT					
Ventura County					
Carlsberg Ranch/Tierra Rajada	-	-	-	-	-
Los Angeles County					
Cruzan Mesa	-	-	-	-	-
LAX	-	-	-	-	-
Orange County					
Fomer MCAS El Toro	-	-	-	-	-
Saddleback Meadows	-	-	-	-	-
Viejo Conservation Bank	\$447,000	-	-	-	-
Tijeras Creek	-	-	-	-	-
Chiquita Ridge	-	-	-	-	-
Radio Tower Road	-	-	-	-	-
Riverside County					
Lake Elsinore	-	\$6,163,000	\$36,981,000	\$11,000	\$66,000
Santa Rosa Plateau	\$16,000,000	\$15,210,000	\$91,263,000	\$3,500	\$20,800
Schleuniger Pool/Clayton Ranch	\$33,013,000	-	-	-	-
Scott Road	-	\$279,000	\$1,675,000	\$9,400	\$56,500
Banning	-	\$1,892,000	\$11,351,000	\$8,500	\$51,100
Former March AFB	-	-	-	-	-
Skunk Hollow/Johnson Ranch	\$59,189,000	-	-	-	-
San Diego County					
Otay Mesa	\$188,712,000	\$14,844,000	\$83,667,000	\$4,200	\$23,700
Subtotal, Real Estate Development	\$297,361,000	\$38,388,000	\$224,937,000		
MILITARY TRAINING					
Pendleton, San Diego County	-	-	-	-	-
MILITARY BASE DECOMMISSIONING					
Former March AFB, Riverside County	-	-	-	-	-
Fomer MCAS El Toro, Orange County	\$59,000	\$15,000	\$15,000	\$1,000	\$1,000
Subtotal, Military Base Decommissioning	\$59,000	\$15,000	\$15,000		
AIRPORT EXPANSION					
LAX, Los Angeles County	-	-	-	-	-
PUBLIC PARK IMPROVEMENTS					
O'Neill Park, Orange County	-	-	-	-	-
RAIL CONSTRUCTION					
Poinsettia Lane Train Station, San Diego County	-	-	-	-	-
ROAD CONSTRUCTION					
SR125, San Diego County	\$239,000	-	-	-	-
SR905, San Diego County	-	\$38,000	\$38,000	\$10	\$10
SR35, San Diego County	-	\$766,000	\$766,000	\$200	\$200
Subtotal, Road Construction	\$239,000	\$804,000	\$804,000		
INDIRECT COSTS					
CEQA		\$4,447,000	\$4,447,000		
TOTAL, ALL ECONOMIC ACTIVITIES					
	\$297,659,000	\$43,654,000	\$230,203,000		
Annualized Impact [5]	\$24,805,000	\$4,121,000	\$21,730,000		

[1] Dashes indicate a value of zero.
[2] Affected areas may differ from those in the proposed rule. Data used in the DEA are current as of January 26, 2003.
[3] Expressed in current year constant dollars. Past year real estate impacts are escalated based on foregone gains in land value that are assumed to be invested at a 3% annual rate. Past year public activities (all other activity categories) are escalated at a 3% social discount rate.
[4] Expressed in current year constant dollars. All impacts are discounted at a 3% social discount rate. Cost of regulatory delay is included.
[5] Expressed as an annuity payment at a 3% social discount rate.